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Infrastructuring Yachay: contexts in action, temporalities and expectations in Ecuador's "Yachay the city of knowledge"

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PhD in Science and Technology Studies

The University of Edinburgh

2020

Declaration

I declare that this thesis was composed by myself, that the work contained herein is my own except where explicitly stated otherwise in the text, and that this work has not been submitted for any other degree or professional qualification except as specified. Parts of this work have been published in: José David Gómez-Urrego (2019): The intersections between infrastructures and expectations: repair and breakdown in Yachay, the city of knowledge in Ecuador, *Tapuya: Latin American Science, Technology and Society*, DOI: 10.1080/25729861.2019.1649963

Abstract

This thesis explores the temporalities involved in the infrastructuring of “Yachay, the city of knowledge” - the most ambitious and controversial public infrastructural project in Ecuador’s history. Yachay, which means wisdom-knowledge in Kichwa, embodies a variety of economic, cultural and political narratives while assembling a variety of heterogeneous actors with particular historical trajectories, motivations and expectations. Yachay is being constructed since 2012 in the valley of Urcuquí, located in the province of Imbabura in the north-central Andean region of Ecuador; it aims to combine a planned sustainable city, a science park with a business orientation, and a research-oriented public university already in operation (YachayTech), in an intervention area of 4500 hectares. Using theoretical tools from the sociology of expectations, Science and Technology Studies (STS) and social studies of time I analyse how a diversity of actors have mobilized expectations during the inception, implementation and reconfiguration of the project. Furthermore, I examine how expectations interact with the infrastructural dynamics of breakdown, and repair/disrepair –materially and symbolically –in the process of shaping Yachay across the project’s life and within a shifting political landscape. To achieve this, I use the Biography of Artefacts and Practices (BOAP) approach to study the dynamics of Yachay throughout time and in practice, in parallel with the diverse range of social relations and settings wherein the project evolves. I aim to follow the life of Yachay in practice along with the contingent elements shaping and being shaped by Yachay.

The thesis draws on fieldwork conducted in Yachay for 14 months between 2016 and 2018. Contemporary ethnography is augmented by historical sensibility and methods to analyse documents in archives. The research specifically follows Yachay through four different periods. First, in the course of its intragovernmental scaling-up process from a technical university to a city of knowledge (2006-2011). Second, during the material implementation of some of its fundamental physical infrastructure (2011-2012). Third, throughout key changes in the operation of its two main institutions (Yachay Empresa Pública and YachayTech) (2012-2017). Fourth, through the radical reinterpretation of Yachay that followed the change of government from Rafael Correa to Lenin Moreno, embodied in the very different context that the latter mobilized (2017-2018).

This thesis contributes to the ongoing discussion around futurity and temporalities in STS through an empirical case from a region of the world largely overlooked in STS. It seeks to do it by extending the common use of expectations in two related ways. One, by framing expectations as interfaces between pasts and futures rather than being mostly future oriented, and thus drawing attention into past trajectories in the analysis of futures and infrastructuring processes; and two, by exploring and problematizing the notion of contexts as forms of stabilisation of particular expectations and exploring their intersections with the dynamics of infrastructures.

Lay Summary

This thesis follows the life of Ecuador's Yachay the city of knowledge from its emergence within Rafael Correa's government until its reinterpretation during Lenin Moreno's government. Yachay is an innovation oriented public infrastructural project aiming to promote cooperation between private, public and academic organisations within a new planned city already in construction. Yachay, which means knowledge or wisdom in Kichwa, is being built in the Ecuadorean Andes. It comprises a sustainable city, a business park and a Technical research oriented university called Yachay Tech that is already in operation. This thesis analyses how different representations of futures and pasts the form of expectations were used in the project to gain support to implement it. It further analyses the different moments in the life of the project along with how actors experienced and influenced the development of the project at different stages. The thesis pays close attention to the role of time in the project both by studying it longitudinally, as well as by investigating how different temporalities such as work rhythms, the pressure of expectations and the measures taken under a new context have influenced Yachay's development. Overall, the thesis aims to contribute to a more integral understanding of the complexities involved in implementing sociotechnical projects and innovation oriented infrastructures.

Acknowledgements

First, I want to thank my supervisors Robin Williams and Miguel García-Sancho. Both have contributed to this work with their detailed comments, their practical suggestions that have shaped my work and the many ways in which our conversations have fuelled my journey through the PhD. I admire you and I appreciate having been able to share these years with you. Robin, thank you very much for Friday's football matches, for all the work you do for STIS and for always having a good mood to ease our meetings. Miguel, thank you very much for taking the time to read in-depth each material I sent you and always lift my spirits in moments of tiredness. Both have been an inspiration to me and it is my honour to work with you.

I want to thank María Paz. She has been the person who has inspired me the most. She accompanied me throughout this journey and her bright mind has allowed me to see Yachay in a way that I would not have been able to see otherwise. Her heart has kept me warm even in the toughest moments, and our chats on our way home after work have been an infinite pleasure. I loved discussing both the ideas we were trying to weave together in our own works and our daily frustrations. Our conversations and love are present in these pages. Sharing these years with you has been the greatest privilege of my life and this thesis would not be possible without your daily care and love.

I want to thank my parents Olga Urrego and Orlando Gómez. They supported me in every step of the way with their care and effort. I now look at you with more respect and affection than ever. To my brother Juan Guillermo who inspired me ever since I was a child with his ideas and his compassionate way of seeing the world. Thank you for your friendship and for keeping me company from afar on this journey. I want to thank my grandparents who lived very different lives from mine but whose paths are supporting and giving strength to mine.

I am forever grateful to all the people in Yachay and beyond who opened their doors to me, shared their experiences and allowed me to carry out this research. I very much appreciate how they treated me considering the difficulty of the circumstances. I will always remember the many conversations and the emotion I felt while I was learning more about Yachay's stories.

To Inesita, Andrés and Julia, dear friends who have kept us company all this time and have fed our desire to continue working on the thesis at times when we needed strength.

Finally, to all the workers of the University of Edinburgh who, with their work, often invisible, keep the University in general running, maintain the libraries in which I studied and give their support to students when we need them.

This thesis and the PhD research were funded by SENESCYT under the international scholarships program.

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CHAPTER 1. Introduction and theoretical framework

1.1. Introduction

Through a biography of artefacts and practices (BOAP) approach (Hyysalo, Pollock, & Williams, 2018; Pollock & Williams, 2009, 2010a)¹, this thesis follows the infrastructure(-ing) of Yachay - a new Techno-city located in Ecuador - during its scaling up process in 2008-2016 and in the later downscaling starting in 2017. The focus of the analysis is on two central factors influencing the making of Yachay: the different temporalities, particularly expectations, and the different infrastructural dynamics. I connect for this purpose the literatures on infrastructures and expectations through three main notions. First, I analyse the role of *expectations* in the processes of acceleration, infrastructuring, breakdown and repair/disrepair. Expectations are understood broadly as real-time representations of future and past technological situations and capabilities (Borup, Brown, & Konrad, 2006). Second, through the concept of *contexting*, inspired in the notion of 'contexts in action' (K. Asdal, 2012), I chart the simultaneous shaping of multiple trajectories and times in Yachay. I examine the particular configurations of expectations and contexts mobilized by actors and materialized in infrastructures across the life of the project. Finally, I develop the notion of *relational infrastructures* to highlight how the building (or the breakdown) of new infrastructures in the case of Yachay implicated both incorporating and reconfiguring already present interrelations and visions (pasts).

The intersection between the fields of infrastructures and expectations, this thesis argues, remains understudied, particularly in the context of technocities and high-tech urban assemblages – despite the proliferation of a variety of planned high-tech urban configurations and interventions worldwide (see for instance, Angelidou 2015; Joss 2010; Kargon and Molella 2008; Raco, Durrant, and Livingstone 2018) (and for critical perspectives, Datta and Shaban 2017; Marvin, Luque-Ayala, and McFarlane 2016; Massey and Wield 1992; Moser 2015). In view of that, my thesis aims to

¹ This will be fully developed in Chapter Two.

contribute in the bridging of the two fields and show the benefits of bringing them together in the study of techno-cities and similar socio-technical projects.

Yachay, the city of knowledge, is the most ambitious and controversial public infrastructural project in Ecuador's history. It is a publicly funded regional innovation system, inspired by the *buen vivir* paradigm² and the triple helix model, i.e. concerted cooperation between public, private, and academic actors and resources-oriented towards innovation (Etzkowitz and Leydesdorff 1995; Leydesdorff and Deakin 2010; Park 2014). Located in the province of Imbabura in the north-central region of Ecuador, Yachay aims to combine a planned city, a technopark with a business orientation, and a research-oriented public university already in operation ("*YachayTech*") with approximately 1240 students.³ According to its designers, the

2 The "*buen vivir*" (good living) paradigm is inspired in *sumak kawsay* and has been consecrated in Ecuador's current constitution, developed in 2008, as Ecuador's political, economic, and cultural guiding principle. *Sumak-kawsay* is considered as part of the ancestral systematic knowledge of indigenous communities in the Andes, across Ecuador and Bolivia, pointing to the ethical and epistemic ways of understanding and relating to humans and non-human entities within the standards of living a good plentiful, balanced in regard to nature community-oriented life (Acosta 2013; Dávalos 2008). *Buen vivir* is one possible translation upon other possible interpretations and translations of *sumak kawsay* such as "*vivir en plenitud*" (to live in plenitude), "*la vida en plenitud*" (life in plenitude) (Macas 2010). Yachay has been referred to as "*una Ciudad del buen vivir*" (a city of-for good living) (Clave 2014) or as setting the conditions to achieve *Buen-vivir* (IFEZ-Ecuador 2013). The name Yachay itself is a word in Kichwa-Quichua, one of Ecuador's main indigenous languages, which may be translated as knowledge or wisdom (For a critique of the use of the word see Chavez & Gaybor, 2018). This connection to Ecuador's indigenous Andean culture was a common thread in the previous government and many of its initiatives. Hence, the "*buen vivir*" paradigm is in itself a way of using time as a political resource, looking back into the deep past in order to legitimate a way of looking forward. I believe it is very important to pay attention to how the present, the past and the future are interacting in Yachay, and in how visions, expectations and promissory work in general threads them together in several ways.

³ From now on, I will refer to the project "Yachay, the city of knowledge" only as "Yachay". I will specifically refer to the public company in charge of the construction of the project as "Yachay EP" or "EP" (Yachay Empresa Pública – Yachay Public Enterprise) and to the University as "YachayTech". I have decided to do this to avoid confusion and be clear with the developed descriptions. Media in Ecuador has constantly equated the EP with the University and has used the terms interchangeably rather carelessly, this has resulted in problems of public representation of the two, surrounded by controversies and the intent from both institutions to draw a more apparent distinction between them (see for example, Hora 2018; Rivadeneira 2018; Rodríguez 2018; Telégrafo 2017). YachayTech and the EP are different institutions, with different missions, different action plans, and, importantly, they respond to different regulations. Yachay EP's purpose is to provide the necessary infrastructure for the project, including YachayTech, and manage it, the EP responds to the regulation of the National Coordinator of Public Companies of Ecuador. YachayTech responds mainly to SENESCYT (Secretaría Nacional de Educación Superior Ciencia y Tecnología – National Secretariat of Higher Education Science and Technology. The highest public institutional authority for these areas in Ecuador).

project was oriented to generate a new economic pole for Ecuador based on joint knowledge generation rather than on exporting commodities, thus challenging centuries of socioeconomic problems. The intervention area is of approximately 4200 ha, and it is projected to be developed within 35 years into the future (see Figure 1). Yachay is being constructed officially since 2012, but as I hope to show in this thesis, its history expands into a deeper past embedded in the political, and economic changes implemented by Rafael Correa's administration since 2007 and the broader changing contexts.

According to the government at the time, Yachay was going to become a city devoted entirely for research, innovation, and the production of a variety of high-tech commodities and services (Yachay 2012a). The plan was to accomplish this goal by clustering the entire project in one place by bringing together actors and institutions from the private, academic, and public sectors. If the expectations mobilized around Yachay came true, Yachay would enable the transition from an economy historically reliant on the extraction and exportation of raw commodities to an economy based on the generation of knowledge-intensive technologies and systemic innovation. Resonating in this way with what, at some point, Rafael Correa's administration defined as the government's ultimate goal: a radical change in the productive matrix of the country.⁴ Hence, Yachay's future-orientation and the imaginaries constructed around it were in part related to the particular conceptions of the country's past developed during Correa's government (where a political void in the near past fed the ideal of a promising future with innovative answers). However, its development

⁴ At the time the project emerged, Correa argued that Yachay was "the most important project for Ecuador in the last 100 years" (Yachay 2013a) and on the day of inauguration of YachayTech he made a quite ambitious affirmation that highlighted the revolutionary character, from their perspective, of the objectives pursued in Yachay: *"an Ecuador that projects itself into the future as a sovereign country that has decided to base its development on the only inexhaustible source of wealth: human talent, knowledge...today begins another boom, that of knowledge, which will last forever because it is an unlimited resource."* (Rafael Correa, Ecuador ex-president. 31st of March of 2014, translation is mine)

has also been shaped by several other dynamics like political disputes with different political actors, including the current government.



Figure 1. A visualization of Yachay in the future used by the EP. The futuristic-looking design of the city is combined with historically significant symbolism like the Andean Cross (IFEZ-Ecuador 2013).

As of 2019, Yachay's own internal dynamics, disruptive events, and economic, political, and sociotechnical shift left the project at the centre of a political struggle between Correa's administration and his successor Lenin Moreno. This led the project to partial stagnation, downscaling, legal dispute, and uncertainty regarding its future (see Figure 2). In this thesis, I analyse the trajectory of Yachay by focusing on different entry points at different moments in the projects' life while embedding the project's trajectory in Ecuador's broader settings at play. To understand the complexity of its configuration, I examine the roles of future-orientation and past configurations shaping the project in these different moments.



Figure 2 Yachay in construction in the valley of Urcuquí. Since 2016, some of the construction work of critical infrastructures is paralyzed due to both financial limitations as well as legal intervention, and much of the site generates a sense of incompleteness. (Source: photo from the author, 2017).

Drawing on this brief overview of the project, it is important to note two crucial decisions I make regarding my use of concepts and language. First, across the thesis, I use the concept of expectations to illustrate the ways in which futures are increasingly mobilized as resources in technological development and scientific practice to draw attention and legitimacy, attract economic and administrative resources, coordinate action and agendas, and materialize imaginaries of the future in the present (Borup, Brown, and Konrad 2006; Konrad 2006; van Lente 1993; Wilkie and Michael 2009). Nonetheless, I also highlight the embeddedness of the expectations in particular pasts and historical trajectories, thus extending the frequent use of expectations as only oriented to the future. This extension is connected with the current call (Edgerton 2008; Murphy 2013) to infuse futuristic innovation-centred analysis of technological projects with historical depth and complementary reflections around the uses of the old and the generativity of the past in techno-social dynamics.

Second, it is also worth noting that there is a rhetoric surrounding new technological endeavours that some authors have called “the hype cycles” or “technological hyped dynamics” (Alvial-Palavicino and Konrad 2019; Dedehayir and Steinert 2016). These are understood as the sequential appearance in the life of new technologies, technological, and scientific fields or techno-social projects of periods of hype, disappointment, and recovery (Borup, Brown, and Konrad 2006; Van Lente, Spitters, and Peine 2013). To avoid this ‘hype’ narrative, the thesis does not analyse Yachay under the rhetoric of the success–failure spectrum.⁵ Instead, it follows the project through different stages, analysing the uses and the effects of expectations in different moments and with different scopes during its development. It focuses on how expectations can become vital resources, as well as detrimental binders, in the development of a sociotechnical project, from its legal configuration to its physical infrastructures. Highlighting by doing so the role of expectations in connecting the actors involved with the extensive dynamics at play.

My intention is thus to highlight and trace relationships with longer duration processes and trajectories. For this reason, the thesis uses historical inspired inquiry to complement the ethnographic research. I believe that historical research provides not only background but also content and depth to the particularities and regularities of promissory work developed in Yachay. In terms of specific methods, for the ethnography I used interviews, document analysis and participant observation. I complemented these with oral history informed interviews and analysis of relevant historical documents.

⁵ This approach differentiates this research from previous research on Yachay, which has used a language more related to the success/failure dyad. See for example how (Fernández-González, Cadenas, and Purcell 2018), use the utopic/dystopic dyad to compare what they call the project’s utopic imaginaries with what they analyse as its “reality” based on their “impossibility” of conducting ethnography in the project. It has to be noted that both its promoters and its chief critics have used the success–failure dyad to describe the project, even when the project is still under construction having covered less than six years of a projected 35-year span. I have decided to avoid this type of rhetoric in order to focus on aspects that may remain out sight if one seeks to collapse the complexities of the project’s dynamics into a success or failure judgement.

I conducted fieldwork in Yachay for 14 months between 2016 and 2018, in 2 different entry points. The aim was to trace the life of the project through different moments from its early design, planning and emergence into its implementation and subsequent reconfigurations. This included, non-participant observation in Yachay EP's offices in Quito, and in multiple institutions in the valley of Urcuquí, where the project is located. I did 80 in-depth interviews in different locations across Ecuador, in Louvain-la-Neuve (Belgium) and through video-calls with people across the globe (Spain, Austria, Ecuador, Mexico). I conducted these interviews with a variety of actors involved in the project at different temporal points, including a change of administration both in the national government and in the EP. The actors are current and previous authorities and public servants from both Yachay EP and YachayTech, students and lecturers from YachayTech, local community members and leaders, entrepreneurs involved in the project, local Urcuquí authorities and national authorities of Ecuador's government. This approach has been complemented with document analysis from both public and private records and archives, and observations of the project's development since its inception and throughout significant events that have shaped it.

Lastly, the argument has the following structure. It starts by discussing throughout this chapter the theoretical approach and the conceptual framework that will be used across the thesis, and my contribution to the respective fields. Following this chapter, in Chapter Two I present the methodological strategy selected for this research and justify this selection, I also discuss its key components and highlight its limitations. Across the methodological chapter, I reflect about how the notion of context will be understood and dealt with methodologically and theoretically across the thesis, explaining why this is important for my approach. Next, each empirical chapter explores the different intersections of expectations with infrastructures across their different dimensions. The research follows Yachay in the course of its intragovernmental scaling-up process from a technical university to a city of knowledge (2006-2011) in Chapter Three; during the material implementation of some of its fundamental physical infrastructure (2011-2012) in Chapter Four;

throughout key changes in the operation of its two main institutions (Yachay EP and YachayTech) (2012-2017) in Chapter Five, and after the change of government that saw Yachay reinterpreted under the new mobilized contexts (2017-2018) in Chapter Six.

1.2. Temporalities and Yachay

This section frames the discussions around time within the social sciences that are relevant for this thesis while centring the discussion on how temporalities have been studied, or not, within STS. It will also highlight why temporalities are an important theme to analyse in Yachay and how I will treat some of the key concepts across the thesis.

Time has historically constituted an important element in social research for all the social sciences; in one way or another every research considers time. Notions of change, development, revolution, stability, variation, adaptation, progress and evolution all imply an acknowledgement of the effects of time on both social dynamics and on the scope of social research. Nonetheless, with some exceptions (Merton & Sorokin, 1937; Zerubavel, 1979), the focus on time, and the development of a rich conceptual language to study temporal dynamics has become more evident in the last decades. In fact, assessing the tradition of social sciences regarding time, several authors have pointed out to the 'neglected temporal dimension' (Wajcman, 2008) in social theory and empirical research (Adam, 1994; Nowotny, 1992a; Šubrt & Cassling, 2001). One of the firsts to make this assessment was the French historian Fernand Braudel, almost 60 years ago. He stated that the social sciences were facing a general crisis concerning time and dispersion. Braudel saw the mounting accumulation of new research and knowledge across the ever-more specialized disciplines, but without the collective efforts to integrate both past and new insights across them in an effort orientate collective research (Braudel, 1960).

Of particular worry for Braudel was the lack of an integrated understanding of time across the social sciences and the particular indifference of Sociology, and other social disciplines, to the problems of duration and long-duration. As Braudel stated, "I am surprised that the sociologists have been able to escape from time and duration. But, the fact is that their time is not ours. It is less imperious, less concrete, and never at the heart of their problems and reflections." (Braudel, 1960, p. 12). Classical sociological theory certainly developed various temporal categories, such as, self-fulfilling prophecies, the role of expectations and future orientation in agency, the commodification of labour-time, the problematic of technical development and societal progress, the problem of generations, to name a few (Mannheim, 1952; Merton, 1948; Weber, 1958). However, with the exceptions of Niklas Luhmann and Norbert Elias (Elias, 1994; Luhmann, 2006), the problem of time itself was not linked systemically with central concepts of sociological theory (Bergmann, 1992). In this sense, I find Braudel's assessment of the problem of time in social sciences relevant for the debate and this work in three crucial points. First, a problem of neglect and lack of centrality regarding the category of time; second, a problem of dispersion and lack of an interdisciplinary collective effort towards integration; and last, a missing link with higher level and longer lasting times, across sociological representations of social times. Nonetheless, that has changed in the last decades.

Time is now central to the study of multiple social phenomena, but particularly to the study of sociotechnical practices, taking many diverse forms that shape both the practices and the communities where they are developed. For example, the question for the future as a temporal sociotechnical phenomenon has become of particular interest, especially for STS scholars.

In this line, scholars from the sociology of expectations have started to pay particular attention to the dynamics of expectations and the role they play in technoscientific organization and innovation (Bakker, Van Lente, & Meeus, 2011; Borup, Brown, & Konrad, 2006; Brown, Rip, & Van Lente, 2003; van Lente, 1993a; van Lente & Bakker, 2010). These scholars have been particularly good at highlighting the performative character of expectations, meaning that they are better understood as ways of

producing and enacting particular social realities, rather than simply representing or mirroring future states of social life that are in principle unpredictable and uncertain. Scholars have highlighted how building up expectations has a central role in attracting interest, resources and a diversity of actors and materials into a particular innovative initiative in technoscientific research with contingent results (Brown & Kraft, 2006; Brown & Michael, 2003; Konrad, 2006). Future oriented narratives, imaginaries and promises have been analysed as ways of managing uncertainty, organizing coordinated action and configuring goals and paths for development. Hence, the performative character of expectations has become central to the current understanding of innovation and the dynamics of technoscientific arenas, including the governance of these processes and how these influence policy making practices (Hielscher & Kivimaa, 2019; Konrad & Böhle, 2019).

Even so, scholars such as Williams and Pollock have noted several limitations in the available scholarship, and have highlighted the importance of not taking for granted a deterministic view of expectations and their performativity. They have pointed out that researchers should not only be focusing on the effects and propagation of performative expectations but also on the types of work and practices involved in developing them. Consequently, STS scholars should be able to differentiate and describe different types of expectations based on their content and time-frames, the differential effects dissimilar sets of expectations may have and the different accountability regimes to which they are subjected to (Pollock & Williams, 2010b; Williams & Pollock, 2016). These authors have also highlighted the importance of studying the temporal dynamics of expectations in the generation and management of links between different ecologies such as industry, academia and the public sector around specific technology development arenas (Campagnolo, The Nguyen, & Williams, 2019a) .

My research points in that direction, focusing on framing expectations on a multi-level analysis of histories and timeframes. To do so, I draw on the current research around expectations and their relation with futurity but I also highlight the past-oriented dimensions of expectations. I understand expectations as temporal devices;

temporal interfaces specifically, that allow for the partial observation and actualization of pasts and futures in order to make them meaningful and actionable in the present for specific actors and groups.

Now, before continuing with the theoretical discussion I will present Yachay in detail, explain how it can be fruitfully analysed as a temporal phenomenon and argue why it is a valuable site from an analytical and empirical perspective.

The city of knowledge: Yachay is currently being implemented in Urcuquí, a small town in the north Andean region of Ecuador. Yachay's creators aim to change Ecuador's economic and political history by constructing a dominant technopole devoted to innovation that may have impact on both Ecuador and Latin America. Yachay is an ambitious venture; it targets to integrate an environmentally sustainable designed Technocity, which is projected to host 400.000 citizens, with an elite-level Technical University (YachayTech) and a technopark that will combine private and public funding. The project has no match in Ecuador's history, and according to Ecuador's ex-president Rafael Correa the project is also unique in the history of Latin America. Yachay's main goals have been characterized by Ecuador's government as: the construction of "a futuristic city for national economic development, in which nature and society coexist." (Yachay, 2013b). Yachay poises to combine a high-tech economically prolific regional innovation system that can alter Ecuador's traditional economic matrix, with the *buen vivir* paradigm that is seen as an alternative to traditional economic growth-centred development and that characterized Correa's government since its arrival to the government in 2007 (Merino, 2016; Villalba, 2013). Moreover, Yachay has been called a city "for the good living", implying that it should become a material instantiation of the paradigm (Clave, 2014).

According to its main figures, Correa's government tried during his decade in power to break with Ecuador's economic and politic immediate past, but also reconcile-with and bring back long-term politic and cultural struggles from centuries ago. This centurial struggles around socioeconomic injustices and inequalities, which could be traced back into the Colonial period and even further back, have been called by

Ecuadorian historian Juan Paz y Miño, “*la deuda histórica*” (*the historical debt*). A debt that no government in Ecuador’s history has been able to pay or even recognize fully. The *historical debt* is framed both in a national scale regarding Ecuador’s history and also in an international scale regarding Ecuador’s asymmetric relation to Europe and the USA (Paz y Miño, 2004). In this sense, one of the first measures Correa took after winning the elections was to summon a constitutive assembly in order to rewrite Ecuador’s constitution. Thus, trying to break with the political legacy of 25 years of political instability that had marked the country since the return to democracy in 1981, and Correa aimed to become the first president in the previous 12 years to finish his governmental period⁶ (Paz y Miño, 2006). The historical dimensions of Ecuador’s political and economic dynamics will be explored in greater detail in the next chapter to set the background in which Yachay emerged. For now, Correa’s government will be the focus.

Correa arrived to power with a new party called “Alianza País”, his surprising popularity weakened the traditional parties that had dominated the political sphere for 25 years at least, and during his government, many of them have disappeared or reorganized into new parties. Correa and Alianza País were able to do so, by embodying not only the values of a new party but also by incorporating into their ranks and political imaginaries, ideas and members of collectives and organizations fighting against long-term structural inequalities and exclusions. Such as the indigenous movements that had by the time a tremendous mobilization power in Ecuador, national trade unions, left-wing academics and organizations, and environmentalist collectives. Many elements of a situated, localism-oriented, nationalist ideology surrounded this project and were used as the main ethic compass during their time in office. In fact, *buen vivir* was incorporated into the new constitution of 2008 as one of the constitution’s main guiding principles (León, 2008). The combination of the buen-vivir ideology with an economic development oriented strategy was one of the most difficult and controversial segments of Correa’s government. Many left-wing early allies left the government’s coalition due precisely

⁶ Before Correa’s presidency Ecuador had had 7 presidents in a period of 10 years.

to inconsistencies in how the government announced buen-vivir guided economic and political planning, while great resources were being invested into large-scale extractivist enterprises. A paradigmatic case for that is the *Yasuní ITT initiative*, a case that combined initial groundbreaking ecological intentions that failed to succeed and that afterwards was critically contrasted with the government's pragmatic approach to oil exploitation.

Taking into account the size and ambition of the project, and that Correa was facing his last term in government; Yachay seems to be the specific site in which the government tried to combine economic development with the buen-vivir paradigm for posterity. In a sense, the validity of the paradigm was at play, as well as the possibilities of combining it with high-tech visions of economic growth. Correa and his allies portrayed Yachay as the long-term legacy they sought to leave to the country, and accordingly the project was central to the government's political aspirations in the present and into the proximate future. This was put into particular focus in 2017, a general elections year, when Correa's party could lose the presidency and majority in the national assembly for the first time in 10 years. Chapter 6 of this thesis focuses on this tension and the surprising consequences that unravelled after the elections.

Taking all these elements into account, my central objectives are to track how by taking Yachay as an infrastructure across its life as my main focus, I can observe the different ways in which expectations and infrastructuring practices interact and change in regard to the actors that link to the project at different moments in time. I look to understand how time comes into play, what are the different choices and strategies shaping expectations and infrastructuring practices and how we can understand the different roles they play in such a large-scale innovation project, which connects a variety of actors with heterogeneous temporalities. I also want to focus on how different actors embedded in different relational positions in the project make sense and make space for their own professional careers and life trajectories while taking into account dynamics and institutions with a longer duration such as the dynamics of the economy and the political sphere. I want to

explore the idea that expectations connect the multiple levels of the social, and are strong devices for generating coordination and synchronization (Borup et al., 2006), and their opposites.

Yachay can be understood as a rich case for temporal analysis for several reasons. For example, for its short, mid and long-term future orientations in a country with a very volatile political life where the stability of the project is closely coupled to that of the government; for how the project draws from particular understandings of multiple pasts to infuse its visions and expectations of the future with historical resonance and a revolutionary character; for the diversity of ecologies (Abbott, 2005) coming together in it with their own rhythms, time-frames, interests, expectations of results and power-dynamics; and for how through the setting of Yachay as an infrastructure we can observe multiple trajectories with dissimilar durations being linked and shaping each other, and thus connecting individual, collective, institutional and national concerns. In this sense, Yachay is a valuable case for attempting a multi-level analysis of time. By multilevel analysis of time, I refer to an approach that is able to grasp different duration and experiences of time unravelling in the same phenomena. From institutional and governmental approaches and relations to temporalities, to practice-specific and actor-centred experiences of time. This connects with the call to study time not as abstract entity flowing through civilisations but as a collective practice that involves taking into account, coordinating, adjusting and negotiating with multiple registers of time both human and not human (Adam, 2004; Mathur, 2014; Pschetz, Bastian, & Speed, 2016). For these reasons, I think Yachay can be analysed as a temporal phenomenon and that this analysis can contribute to a more robust understanding of temporal analysis in STS.

Similarly, at an empirical level the case of Yachay is of particular interest for at least three reasons: its geographical location with its specific socioeconomic history, how it combines technoscientific and urbanistic themes, and the “early” stage of the project. Next, I will argue for each one of these three reasons.

Regarding the first point, its uniqueness in the history of Latin-America makes it an important starting point for STS to analyse these phenomena in the south American context, which until now has been only peripherally studied in STS (Medina, Marques, & Holmes, 2014). This is of particular importance taking into account the current call to “*provincialize*” the discipline (Anderson, 2017; Harding, 2016; Law & Lin, 2017; Lawhon, Nilsson, Silver, Ernstson, & Lwasa, 2018) and to generate theorizations that are sensible to contexts different to those commonly associated with STS, those of Europe and North America: “a means to reorient STS—in particular, to refigure East Asia as a site of theory making in STS, not just a space for data extraction or a place to which European concepts diffused.” (Anderson, 2017, p. 229). Moreover, there is also a call coming from Latin America for STS scholars to be more symmetric in the need to explain both the significance and the historicity of research-locations that have been associated with universality in STS. In this sense, across STS some contexts, mainly those not belonging to Northern Europe or North America, have to be explained and historicized in detail, while others seem to be taken for granted and scholars assume their contexts as universal and their historicity as dispensable. Thus, not only analytically taking contexts as unproblematic entities but also assuming there is no need for exploring, problematizing or justifying such contexts (Kreimer, 2019b). Correspondingly, Yachay is a great setting in which to analyse and develop STS understandings around the critical roles that the specificity of the Ecuadorean dynamics have in technoscientific initiatives. In this line of thought, Ecuador’s own position in the field both as contributor and as object of study for STS is yet to be explored. For instance, in three major analyses of the state of the art in STS in Latin America (Kreimer, 2007; Medina, Marques, & Holmes, 2014; Thomas, 2010), of which Medina’s *Beyond Imported Magic* is perhaps the most relevant present-day edited volume of STS in Latin-America, Ecuador is hardly mentioned and none of the studies presented or discussed focusses on it. My research tries to highlight the relevance of the Ecuadorian setting both for Latin-American and for STS.

Furthermore, Yachay not only appropriates and transforms the model of the technocity and the techno-park from other ventures across the globe, but also combines it

with very particular political and economic means (such as the buen-vivir paradigm). These particularities could, not only, transform the way these models continue travelling across settings (for instance to other Latin-American countries already looking at Yachay attentively), but also provide new insights of how to study and understand these phenomena through the lens of STS in particular and interdisciplinary social science in general.

Regarding the second point, Yachay is more than a techno-scientific enterprise; it is also an urbanistic challenge, which implies that negotiations and decisions around the long term planning and configuration of the spaces involved are being taken. These can provide insightful and interesting ways of analysing the constant negotiations around the role of science and technology in the forming and organization of infrastructures, actors' trajectories and collective practices. Specially in the current debates in STS around the processes of construction and the significance of techno/eco-cities, and their relevance for urban design with promises of urban sustainability (Joss, 2011; Joss & Molella, 2013). Investigating how temporal dynamics such as the ways in which the pasts and the futures are observed, shaped and mobilized in a case such as Yachay could provide important considerations to this area of research. Especially if we take into account that the tendency of the design and reconfiguration of urban spaces to fuse with techno-scientific, ecological and futuristic visions seems to be growing globally (Joss, 2010; Rapoport, 2015). Similarly, as Simone Abram has argued, traditional work on time within ethnographic work has been focused on tracing changing time-scapes and epochal breaking points, such as the notions of the Anthropocene, neoliberalism, among others (Abram, 2014). Differently, my research will focus on understanding the different ways in which temporalities are experienced, shaped, negotiated by different actors coming into the project with their own motivations, and how temporalities influence the narrative and material practices of infrastructuring and expectations in Yachay.

Regarding the third point, the current stage of the project in Yachay is very interesting because it is in its early stages so it is already being constructed and people are already shaping it from within, for example YachayTech is already hosting students

and academics. However, the previous planning stage is still very close so we can trace the emergence of the project along with the early interactions between the original Master Plan and its effective reconfigurations in daily practices. My intention is to develop a long-term study of Yachay, in the framework of the BOAP approach (Williams & Pollock, 2012) that goes beyond a snap-shot study. Therefore, I consider that analysing Yachay in this way is relevant both theoretically and empirically, and could shed valuable insights into the roles of temporalities in shaping technoscientific and urban ventures.

The next section will continue with the theoretical discussion paying specific attention to the analysis of futures in the literature, describing my approach to expectations and the elements of infrastructures I will be focusing on for this thesis.

1.3. Literature Review

1.3.1. Future and past as time horizons, and the role of the present

In 1976 Niklas Luhmann noted that the history of the future as we know it “does not reach very far back” (Luhmann, 1976, p. 130). Scholars seem to agree that our notion of a future open for scrutiny, innovation, control and increasing projected action emerged around the 17th and 18th centuries with the collapse of other forms of societal organization and the emergence of the bourgeois society (Adam, 2006a). Luhmann affirms that socio-cultural evolution transforms not only our conceptualizations of time, but time itself. Enacting the future as a “storage of not-yet-realized possibilities and emergent properties” is a relatively new way of understanding, and acting, with the future but by no means the only historical relation with time or mode of time-keeping practices (Adam, 1994; Birth, 2012a). This new way of coming into contact with the future emerged historically accompanied by an opening of the past too.

According to Luhmann, the decay of social differentiation systems dependent on the notion of “natural forms” during the 17th and 18th centuries, along with the structural transformations that came with the bourgeois society produced a “temporalization in the chain of being” (Luhmann, 1976, p. 131). The supposition that all order, including social order and the identity of beings, was justified and defined by a cosmic and religious order started to shake. With it, the view of the past as necessarily grounded on a single initial event from which time itself was set into motion and defined all natural forms, started to change too. By the 18th century, the notion of a chronological time organized around the “before Christ” scheme was beginning to be widely accepted and with it, the possibility of indefinite retrospective historical research arose, as the past was no longer chained to an initial founding event. According to Luhmann, the contextual research interests and the research tools available would then be the only limits for historical research of the past.

These social structures allowed for the emergence of complex temporal forms, the future could no longer be fully inferred from the past, in fact: people started to imagine it as radically different. Then, if the future is underdetermined by the past, the future is open for “emergent properties and not-yet-realized possibilities”. With this amplification of both past and future horizons, uncountable possibilities to structure both arose, and with the widening of the past and future horizons came higher complexity. Complexity implies possibility, and with possibility comes uncertainty and of course risk (Adam, 1999; Flaherty, 2000). Managing this complexity emergent from the opening of the past and the future, required an increase in “anticipatory behaviour, more acting before the event, in literally more future-oriented planning” (Luhmann, 1976, p. 135). Interestingly, the present then lost duration; it shrank and took the form of the turning point, the frontier where the past switches into the future, a moment both enormously determined by the past and infinitely open to an uncertain future. In this perspective on time we can conceive of each present as having many different futures, as contingent.

Then, we can see how the past, the present and the future shape each other and conform a sense of time continuity even when this continuity implies difference and

change. A particular shaping of one would resonate with the others as, “If there is any unity in time itself, any fundamental change in the conception of past cannot remain without consequences for the perception of the future” (Luhmann, 1976, p. 132). Interestingly, Luhmann defines time as “the interpretation of reality in regard to the difference between past and future” (Luhmann, 1976, p. 135). I wanted to focus on these points in order to highlight how changes in the way we think the future or into the future, shape and are influenced by how we understand the past and our sense of the present. I think that expectations can then be also understood as recombination points, as interfaces, between the past and the future. This is, as interfaces through which they shape each other contingently, marking continuities, ruptures, the emergence of new properties, and the reappearance of others.

1.3.2. Time and social theory

In her 2004 book *Time* Barbara Adam affirmed that an adequate account of time in the social sciences is one that indicates layers of meanings. Layers that are dispersed across beings and relations, both ancient and instantaneous (Adam, 2004). Time is a difficult object of study. At the same time, it seems to permeate everything as it embodies objects such as clocks and the Gregorian calendar (Birth, 2012a), while remaining inapprehensible to any intent to put clear boundaries around it. This may be why the study of time in the social sciences has produced a multiplicity of social times proper to different social activities or arenas, many that seem sometimes irreconcilable or even contradictory to one another (Nowotny, 1992b). Thus, the picture of time produced across the social sciences seems more like a mosaic than a jigsaw in the making, or a map to orientate navigation (Šubrt & Cassling, 2001).

This is problematic as it reproduces a certain sense of incommensurability between social research disciplines, making it more difficult to promote interdisciplinary research and generate more integrated and complex accounts of social phenomena. In other words, the landscape seems to disjoint and fragment social research more than it outlines research horizons for common efforts.

Even so, if time permeates every experience we have and our struggles to organize it, measure it, regulate it, transcend it, understand it, or even just live it, lie “at the root of what makes us human” (Adam, 2006b, p. 119) then these multiple encounters with times can tell us something very valuable about social life. Considering time allows us to gain insights around how we make sense of individual and collective processes, historical stability and change, social continuities and ruptures, and about the diverse ways in which temporalities shape social life, and the other way around. Our relations with time entail also the different ways in which humans have searched for transcendence, surpassed limited life-spans, dealt with aging and emerging individuals, the conservation of past accumulated knowledge and practices, and how we have strived for meaningful intergenerational learning against the backdrop of death (Adam, 1994; Mannheim, 1952). Thus, we can find in daily-practiced cultural life relations with seemingly intangible terms such as the past, time and death, which can be studied through their personal and collective configurations. If culture and social memory constitute ways of going beyond individual impermanence then there is no doubt that technological artefacts are also sites of encounter, permanence and struggle within temporal change. As Bruno Latour puts it: “ technology is society made durable” (Bruno Latour, 1991, p.103).

More importantly, scholars from the social sciences through the analysis of the connections between time and technology have been able to develop ways to analyse time not as an abstract cryptic phenomenon but as a concrete, practical, technologically embedded, historical, materialized and politic phenomena (Adams, Murphy, & Clarke, 2009; Bastian, 2014; Golden, 2002; Sharma, 2014). For instance, scholars have analysed the ideals of indefinite progress associated with utopian ideas around technological advancement (McBride, 1992); the dynamics of cultural heritage and the constitution of family networks with knowledge, techniques and technologies in the centre stage (Carnegie, 2010; Swartz, 2009); the social measurement, management and political organization of time in a variety of social spheres (Birth, 2012b; Tabboni, 2001; Wajcman, 2018); the reciprocal relationship between technological devices, daily life and changing time practices (Bittman,

Brown, & Wajcman, 2009); the complex interactions and negotiations involved in telling time across human and non-human interrelations (Bastian, 2012; Huebener, 2018), among many others.

Currently, the focus around the study of time and its interrelations with technology has been converging around two temporal phenomena that seem to be interrelated: social acceleration and time pressure. While in previous decades a strong societal commitment with techno scientific advance as source for social progress had forecast the emergence of a leisure society in which technological automation in the work place and at home would allow more free time to spare and to devote to leisure and other activities, a different landscape has emerged. Our epoch has been characterized as “time-pressured”, in a constant struggle to find time, to stretch time in order to fit an ever increasing amount of activities and expectations (Nowotny, 1994). The source of time-pressure is often located in the pace of production, communication and the rhythms of life in general have accelerated in respect to other epochs. Consequently, the speed of change in cultural life, technological innovation, information transfer and even the level of personal identity building have been profoundly influenced by this acceleration (Wajcman, 2008). In other words, from this perspective “any attempt to make sense of the human condition at the start of the new century must begin with the analysis of the social experience of speed” (Scheuerman, 2004, p. 1).

Harmut Rosa, one of the main researchers of social acceleration, argues that social acceleration constitutes one of the main features of any process of modernization. For Rosa the notion of social acceleration has not been granted the same amount of attention as other phenomena closely linked to modernity such as: individualization, rationalization, functional differentiation and the objectification of nature (Rosa, 2003). Scholars have traced and analysed the interrelations of social acceleration, time-pressure and technology in diverse scenarios, including the household, the gender division of house labour and the gender division of leisure time (Craig, 2007; Wajcman & Bittman, 2004); the amount of time invested in the workplace, working hours and the raising of time-pressured demands and tension perceived by workers

(Green, 2007; Ulferts, Korunka, & Kubicek, 2013); the impacts of social acceleration on democratic participation, power formation and the political sphere (Flaherty, 2010; Scheuerman, 2001), among others.

Even so, Judy Wajcman (Wajcman, 2008) has identified two problems related to the notion of social acceleration: first, the theory around social acceleration seems to be developed without a continuous grounding on empirical studies so it tends towards problematic generalization, and leaves important factors in play unexplained and unidentified. Second, the theory seems to adopt a technological determinism view around the influence of technologies in social change that has been widely contested in STS and assumes an homogenous impact of social acceleration not taking into account gender, age, economic and context-related variables (Sharma, 2014; Wajcman, 2008). This second problem arises according to Wajcman due to “failure to engage with the burgeoning literature in the social studies of science and technology (STS)” (Wajcman, 2008, p. 61), representing a missed opportunity for social thought around time to enrich the analysis and ground it empirically. Wajcman argues that there is an increasing awareness in the social sciences about the importance of taking temporal issues seriously. Nevertheless, there is a pressing need to match the theory with equally significant empirical research in risk of losing social relevance and weakening the robustness of the knowledge produced: *“while the hitherto neglected temporal dimension in sociological theory is now being addressed, there is an urgent need for increased dialogue to connect social theory with detailed empirical studies. Without this, we will continue to have difficulty distinguishing social science from science fiction”*. (Wajcman, 2008, p. 59)

Therefore, it is safe to say that there is an important role for STS to play in the study of time in the social sciences. STS can not only help grounding it by applying the insights won over the past decades of research across a multitude of specific settings, but also by enriching the approaches through which technology and its relation to social change are framed and understood. Similarly, there is a need for a multi-level analysis of time that is able to make sense of both the aggregate and the dissimilar. In the following paragraphs, I will develop this idea along with a description of the

main strengths and limitations of how STS have related to the study of time in general, and with longer time-scales historical perspectives in particular.

1.3.3. STS and some problematics around history and time

Historically, STS have only partially overlapped with Sociology, from the outset a range of disciplines have enriched the discipline, like anthropology, history, political science, gender studies, geography, philosophy of science, among others. Importantly, STS have traditionally argued in favour of theorizing through empirically situated case studies which has allowed for precise and rich descriptions of social phenomena, avoiding universal generalizations, macro-sociological categories and grand narratives (Law, 2008). Consequently, STS has focused on the complex webs of historically and spatially situated practices and how these entangled with other human and non-human elements shape the conditions for the emergence of social phenomena such as scientific knowledge and technological artefacts. In other words, STS have a highly developed sensitivity for situatedness, for the places where science, technology and knowledge occur and take forms; to use Anne Marie Mol's words: "The social studies of science and technology tends to insist on immanence" (Mol, 2010, p. 254).

This emphasis on the practical and the situated has developed some important advantages as well as some limitations for research within STS. On the one hand, this has allowed STS scholars to develop studies in which they continuously produce and rework together the data and the theory. Questioning the utility and meaning of overarching concepts and abstractions, while focusing on the rich details of case studies and on the specific types of work involved in creating and sustaining diverse social arenas. Law frames it by arguing that, "in the core STS sensibility abstraction is only possible by working through the concrete. Or, to put it more conventionally, theory is done in the form of case studies" (Law, 2008, p. 630). Hence, STS may not

have been directly interested in duration per se but rather on how duration is achieved and maintained through the diverse types and effects of both material and intellectual work involved in shaping and making social phenomena durable. These characteristics have made STS both very precise and sharp in its resulting accounts and insights, while being adaptable in the amount and quality of settings its perspectives and findings have been applied to.

On the other hand, this focus on the specific, actual practices and the particularity of social settings have settled a great amount of research done within STS far away from concerns on long duration and macro-sociological issues. Asdal argues that in the last decades this has opened a deep divide between more traditional historical research on science, focused on (past) texts and longer timeframes, and STS which has focused on the contemporary events, and on the “practices in action” surrounding their continuous emergence (K. Asdal, 2012). What once was a very fruitful and effervescent relation in the early stages of STS, has become weakened and both the disciplines’ respective research paths and the understandings of their respective objects of studies have drifted apart (Daston, 2009). Accordingly, STS have become less, and may have never been, interested in producing macro level unified accounts of long sociotechnical trajectories and elaborating on grand narratives; in fact, STS may not be even interested in formulating a synthesized account of what science is after almost half a century of miscellaneous research. The question itself: what is science? May be considered as a bad formulation of the problem from an STS perspective (Law & Mol, 2001; Mol, 2010). More importantly, this inclination for thick and rich situated descriptions has favoured a widely spread preference for ethnographic approaches as research methodologies within STS, preference that comes with all the advantages and shortcomings of such methodologies (K. Asdal, 2012; Williams & Pollock, 2012).

This is particularly true for one of the most successful strands of STS in the past two decades: Actor-Network Theory (ANT). ANT gained its position as a main STS approach by criticizing traditional social theories’ dependency on contextual deterministic explanations and uncritically stabilized concepts such as class, power,

nature, culture, society to explain social phenomena (Latour, 2005). ANT theorists argued in favour of reversing the hegemonic explanatory structure in social theory: society and pre-existing social structures should not be used to explain social phenomena, but rather “society is what needs explanation”; economic and social interests were no longer sufficient as explanatory resources (Law et al., 1987). Similarly, ANT heavily criticised the traditional ontological division between subject and object, trying to erase the porous borders between the cultural and the natural, and between the technical and the social (Callon, 1986; Latour, 1999; Latour, 1993).

They proposed that non-human actants are as important as humans are in conforming emergent sociotechnical assemblages and allowing for these heterogeneous actor-networks to have agency, transform material worlds, enact new worlds and make them durable (Callon & Law, 1995; Law, 2012; Law & Mol, 2001). ANT researchers have achieved these by producing highly differentiated and sharp descriptions of diverse objects and practices that generate dissimilar entities, processes and effects across very specific settings. Such as the laboratory (Latour & Woolgar, 1986), scientific path breaking achievements (Latour, 1983), urban studies (Farias & Bender, 2009), colonial expansion (Law et al., 1987), medical practice and health (Mol, 2002, 2008), finance and economic settings (Callon & Muniesa, 2005), among many others. Many of these insights are very valuable and have shaped a great amount of research done in STS in the last 30 years; even so, ANT has many shortcomings that have been highlighted both from within STS and from other disciplines. The most problematic one may be its tendency to take preference for the enacted, for the emergent, the new; its injunction: “don’t take anything for granted” in order to be able to follow the shape-shifting tendency of materials and actors (Law, 2012, p. 174).

Therefore, the conditions that allow for that emergence, the longer trajectories of the actors and the materials, the deeper past resonances, the common features and patterns between different locations and times, and in some degree historical stability itself are set out of focus in favour of a clearer view of the effects being generated. Mol argues that, *“ANT asks not where the activities of actors come from,*

but rather where they go: effects are crucial.” (Mol, 2010, p. 255). Among other critiques, this has caused ANT to be characterized as flat ethnographically, pursuing actualism, and short sighted in respect to the conditions that enable the emergence of the new (Asdal, 2012; Farías, 2014; Williams & Pollock, 2012).

Nonetheless, there are emergent trends of research in STS that work to incorporate historical approaches to research in order to enrich both historical accounts as well as STS perspectives. These studies try to inject some temporal and spatial depth into ethnographic accounts, and analyse techno scientific phenomena as complex events that take place across multiple sites and timescales that should be analysed together in order to produce more robust and deep accounts of these phenomena (Asdal, 2012; Dear & Jasanoff, 2010; Williams & Pollock, 2009). I want my research to follow this path combining insights from STS with a historical sensibility that can help understand my case study in a deeper and sharper manner. Also, I consider that the research area of techno scientific expectations is a promising one for pursuing a combination of sociological, STS and history-inspired methods, as expectations embody elements that refer us at the same time to the multiple durations of social dynamics unravelling simultaneously, while deeply resonating with the specific ways of observing, understanding and mobilizing the past. I will argue in favour of this hybridization in the following sections of this chapter.

For all of these reasons I believe that ethnographic approaches in STS need to be complemented with enriching resources from other disciplines, particularly from historical studies and current social thought around time that study temporal phenomena in a more systematic way (Adam, 2008; Bastian, 2009; Birth, 2006, 2007; Huebener, 2015a, 2018; Pschetz & Bastian, 2018; Sharma, 2011). A fertile field to do so is the field of research around techno-scientific expectations and a specific case study as Yachay. This can allow me to study time and the future in an interdisciplinary manner, theorizing through and together with the construction of the detailed data, pursuing both a rich description of the emergence and development of a new techno scientific innovation, and situating it across a wider framing of social phenomena. In the following section, I describe several approaches to research around expectations

and the future, framing my take on the literature. Then, I will discuss the literature on infrastructures, how it relates to Yachay and my specific approach to it. Lastly, the chapter ends by describing general conclusions and setting the scene for the methodological chapter.

1.3.4. Anticipation and beyond: the study of expectations as the future in action

In the last decades, as the social sciences in general have begun to take the theme of time and temporalities seriously one significant discussion regarding temporal configurations has emerged revolving around *anticipation and a potential paradigmatic shift in the human sciences around it* (Poli, 2014; Rosen, 2012). Anticipation has been studied across disciplines and applied to a diversity of objects of study ranging from biology, the mind and cognitive systems (Clark, 2013b; Friston, 2010; Friston, Adams, & Shipp, 2013; van Dijk & Rietveld, 2018) to social systems such as economic arenas, financial practice and governmental politics (Amoore, 2009, 2013; Esposito, 2013; Mackenzie, 2017). One of the basic ideas around anticipation is the notion that not only the past but also future(s) generate the present. That is to say, an ongoing and proactive relation to future(s) in the present allows those futures to have generative power despite that, in principle, they cannot be fully predicted and anticipated (Cevolini, 2016; Poli, 2010). Then, “an anticipatory behavior is a behavior that “uses” the future in its actual decisional process” (Rosen quoted in Poli, 2014, p. 17). This thesis focuses on the strategic use of futures in decisional processes.

Likewise, in STS, anticipation has been studied with the practice-oriented approach that characterizes the discipline (for future as practice in STS, see Alvial-Palavicino 2016) through a variety of case-studies analyzing the dynamics of expectations (Borup, Brown, and Konrad 2006; van Lente 2012), predictions within promissory work (Pollock and Williams 2010b, 2015), and sociotechnical imaginaries (Jasanoff 2015; Jasanoff and Kim 2009). For instance, in the use of predictions in the shaping of technological and service markets by industry analysts and technological

forecasters (Pollock and Williams 2010b, 2015); analysing their use in the shaping of synthetic biology by a variety of actors and institutions (Schwyter and Calvert 2015); their influence in the interactions and applications of academic practices and knowledge in the business sector and in the realms of law (Juhl and Buch 2018; Pickersgill 2011); mapping a variety of possible futures promised and contested in different waves of scientific and technological development in fields such as artificial intelligence (Galanos 2018); in the neurosciences, particularly around future neuroimaging and neuromodulation capabilities (Rusconi and Mitchener-Nissen 2014); and in sustainability transitions based on the development and expansion of renewable energy projects and hydrogen storage technologies in the US and China (Bakker, Van Lente, and Meeus 2011, 2012; Korsnes 2016). Interestingly, anticipation and expectations have also been explored as powerful tools around which scholars and social movements can rethink and rework meaningful relations with both futures and presents as political nodes (Adams, Murphy, and Clarke 2009; Esguerra 2019).

STS has found in the study of expectations, future orientation and their diverse roles in shaping techno scientific change and innovation a productive field of research in which it can study time and the future in richly detailed, situated and diverse sociotechnical contexts (Borup et al., 2006). Additionally, the study of expectations has allowed STS scholars to apply, adapt and develop mainstream STS insights and findings to new social arenas.

STS has been of fundamental importance for the development of this strand of research and has contributed both theoretically and with empirical evidence to the advance of the sociology of expectations and the social studies of the future. In recent years the role of expectations in sociotechnical innovation has attracted a lot of academic attention, innovation itself is now being portrayed as a heavily future-oriented process, centred around generating and promoting emergent opportunities and capabilities. Borup et al. define technological expectations as “real-time representations of future technological situations and capabilities” (Borup et al., 2006, p. 286) and affirm that they play a central role in both organizing social action by providing orientation perspectives and mediating between societal levels and

across institutional boundaries. They constitute an important tool in macro, meso and micro levels for networks, institutions and actors to mobilize and coordinate resources and action. For example, they constitute a powerful way to “motivate heterogeneous actors such as business firms, policy actors, financial actors, NGOs and private investors to engage in promising innovation fields.” (Konrad, 2006, p. 429)

Expectations are actively deployed in order to shape the potential of new technologies, to pre-exist them in a way (van Lente, 1993a). Sometimes expectations take the form of visions, organized in a way to make visible the invisible displaying an organized and managed future apt for showing those who could find reasons to join. Futures in which the technical and the social tend to be profoundly intertwined. Other times, expectations take the form of promises, of promised potentialities to be unleashed, new capabilities that could trigger desired social transformations. We can subsume these ways of generative future-orientations under the notion of promissory work. In the same line, promissory work allows for anticipation and the advance of economic, political, organizational, and discursive strategies by actors or collectives in order to gain power to modify and give form to arenas and markets allowing them to shape the future (Pollock & Williams, 2010b; van Lente & Bakker, 2010).

Hence, expectations are not passive ways of representing objective states of the future or simply presenting current intentions, but they are generative in a number of ways. For instance, building expectations around a specific product or technological project allows to attract interest, galvanize commitment, provides certain structure and legitimation regarding roles and steps to take, nurtures investment and attracts valuable resources ranging from experts to materials and access to wide-ranging social networks (van Lente, 2012). Also, expectations help to define more clearly what to expect from a future that is in principle unpredictable, and conforms visions of what risks could be faced in the short and long term, influencing in this way what opportunities can be looked for, and dangers prepared against, regarding surprising events. In this sense, expectations shape both hope and

fears, and can also be hyped towards a negative side, prompting negative expectations around possible futures to be avoided, failures to be prompted to detect and economic losses to dread (Tutton, 2011). Furthermore, actors have learned to navigate in different ways the complex landscapes of expectations by, for example, mobilizing low expectations at an early stage of a technological development as a way of avoiding overcommitting to specific hyped objectives, gaining momentum and managing optimism (Gardner, Samuel, & Williams, 2015).

Often, visions of the future take place in arenas where there are a multiplicity of competing expectations, sometimes related to other competing technologies being developed simultaneously, other times to expectations more deeply rooted in the social fabric coming from the past. Hence, particular futures are predicted in struggle to other futures, and also in respect to the continuity of the past; in Tutton's words: "every future is predicated on others to be avoided. In parallel with positive visions and hopes of future advancements, fears and tenebrous imaginings of future risk are often associated with scientific and technological change." (Tutton, 2011, p. 412). Through all these facets techno-scientific development seems to be closely coupled in our times to a large expectations environment that generates promissory storytelling as a fundamental segment of the innovation process without which it would be very difficult to finance, attract attention, commercialize and legitimate techno scientific projects, products and services (Borup et al., 2006; Garud, Schildt, & Lant, 2014). Additionally, expectations are materialized through present practices and infrastructures that embed ways of envisioning the future into present materialities that allow performing users, organizing spaces and populations through foresight practices of risk management, consolidating politicized ways of understanding technology, empowering decision making and promoting to commitment to specific paths for economic development (van Lente, 2012; Wilkie & Michael, 2009).

As mentioned above, expectations and promissory work in general are vital for understanding techno-scientific dynamics and change as they allow for the coordination and mediation between levels of organization. For example, individual

academics or engineers opening professional space for actors and having personal expectations for their work are entangled in larger expectations arenas within research centres or academic networks struggling to attract funding, students, disciplinary recognition. These networks and centres are embedded within larger national and international systems that conform institutional landscapes that include economic groups, governments, research funders, international conventions, etc. Hence, as Borup et al. affirm: “expectations constitute the missing link between the outer and inner worlds of techno scientific knowledge communities and fields” (Borup et al., 2006, p. 287). Expectations help to construct both present day obligations and commitments, and also agendas on the road to the future that imply taking into account higher order dynamics and contextual factors that may or may not be open to action from the perspective of specific individual and collective players (Korsnes, 2016). In this sense, expectations vary in their “level, content and modality” (Konrad, 2006) as they can be negative or positive, general and abstract or very meticulous and specific, refer to both macro elements of social life as well as particular micro dynamics, and combine a variety of social, technical, economic and scientific elements (van Lente, 2012).

Now, just as expectations are highly important for the arousal of a field or project they can also be quite harming, as the level of hype tends to surpass the project’s capacity to perform and generates disillusionment, loss of confidence and could put at risk the credibility and legitimacy of whole organizations, actors and fields (Brown, Rappert, & Webster, 2000). In this respect, Brown has showed how the fields of nanotechnology, stem cells research and biotechnology have been damaged by the constant cycles of hype and disillusionment surrounding them in the past decades, and how low accountability allows that “early hopes are rarely proportionate to actual future results” (Brown, 2003). Scholars have tried to characterize the general patterns of this hype cycles and describe them in systematic ways across settings and cases (Van Lente, Spitters, & Peine, 2013).

For all these reason STS scholars have started analysing expectations not only as dynamic and anticipatory in nature but also as performative; this is, as being able to

generate and enact the futures they visualize, providing key assistance in making them real (Michael, 2000). In other words, “successful promissory work would be actively engaged in constituting the reality to which it points” (Pollock & Williams, 2010b, p. 538). This performative effect is powerful as expectations include also explicit or implicitly designed roles for actors and users involved around it, and also embed historical values and conceptions about meanings and applications (Oudshoorn & Pinch, 2003; Wilkie & Michael, 2009). Thus, if technological expectations can be performative, they are able to influence not only the technical futures yet to come but also the social uses and interrelations with those technologies. As STS have showed these roles and values will be transformed, reinterpreted and translated in use; nonetheless, taking into account the design process of artefacts is very important to gain an integral understanding of a technologies’ more extensive trajectory (Williams & Pollock, 2009).

Now, I am going to describe important qualifications that scholars have highlighted in the last years of research around this area, which I think, constitute important features and paths to explore expectations from a STS perspective.

First, expectations tend to be dispersed and distributed around complex webs of different actors, materials and institutions. This diversity of agents helps to sustain, recalibrate and promote the different visions in play across time and space. The expectations field is complex precisely because it includes actor-specific expectations, collectively held expectations, institutional expectations and project-specific expectations, which are mutually affecting and have to be, at least, loosely coordinated to achieve effective agency and credibility (Campagnolo, The Nguyen, & Williams, 2019b; Konrad, 2006). In fact, if expectations are successfully mobilized, for example by becoming institutional objectives that an authority can then request from other actors, they can become requirements, this is a process scholars have studied as the “transformation of a promise into a requirement is a central mechanism in the dynamics of expectations: the ‘promise-requirement cycle’.” (van Lente, 2012, p. 772).

Similarly, establishing networks of distribution, legitimation and support for the promissory work is fundamental in order to consolidate them as “guiding visions” both robust and open to interpretation, as distributed agency is coordinated and a diversity of social actors can be mobilized in favour of the project. Rohracher has shown this in respect to the development of “sustainable energy regions” in Austria, where guiding visions were highly contested but the discourse was open to reinterpretation and changed even in the higher levels incorporating community visions and interests, managing to achieve co-development in an intermediate time span (Rohracher, 2010). Additionally, the distribution of responsibility for carrying out the expectations and for being object to accountability practices is also varied and asymmetrical. This means that not all the actors, human or not, will be expected to carry out the expectations formed even if they were part of their mobilization; they will also be scrutinized and subjected to dissimilar kinds of accountability. For these reasons, it is very important to ask who is responsible for carrying out the promises made and the enacted visions? And who assumes the risk of them never being grasped?

Second, the notion of performativity can be specified and scrutinized more acutely through empirical research allowing social researchers to differentiate between types of performative expectations, and analyse the particularities of each one. More specifically, authors have searched for ways to examine if expectations will be achieved or not, to what type of accountability they will be submitted and which practices are involved in the development of these elements. This prompts an analysis of expectations without assuming they have a linear-causal or deterministic nature concerning technoscientific innovation: not every expectation will bring about a new world and we should not treat “technologies as a direct product of expectations” (Williams & Pollock, 2016, p. 122). Therefore, considering the specificity of different types of promissory work may bring insights into how and why some claims bring about the worlds they postulate while others fail to do so and dilute.

For instance, Pollock and Williams (Pollock & Williams, 2010b; Williams & Pollock, 2016) argue that through their research on the Gartner industry analysts they have been able to single out at least three types of performative expectations based on differentiated effects and the types of accountability and verification they are subject to. Industry analysts are an emerging class of knowledge producers specialized in systematizing, formalizing, evaluating and selling information about vendor statements and visions. Their work consists on gathering information about the promissory work of different vendors, subjecting it to strong schemes of accountability, which they designed themselves, and circulating those expectations around the market as required. Taking inspiration from advances in performativity theory developed in the work of Michael Callon (Callon, 1998, 2007) in the context of Economic Sociology and the work of Donald Mackenzie in the sociology of finance (Mackenzie, 2006), Williams and Pollock are able to trace a provisional typology of promissory work (Williams & Pollock, 2016). In this typology, they locate three types of “promissory behaviour”: infrastructural knowledge, Statements and their world, and visions let loose. Infrastructural knowledge is characterized as being a strongly institutionalized set of knowledge and practices. Infrastructural knowledge tends to become invisible on a daily basis, as it is perceived as part of the environment players navigate, has a strong and enduring influence upon the market and actors, as it defines and categorizes technology markets. Infrastructural knowledge is authoritative, and works in a slow and careful manner; many of its effects may be invisible to some of the actors involved but have long lasting effects. Statements and their world can bring accountable change but are far more contested as they tend to consist in assessments of where and why particular vendors should be located within classifications that qualify both their visions of the technological future and their abilities to develop their visions. Hence, these qualifications tend to produce winners and losers, and as a result, vendors can be ignored or not considered apt for providing the required services.

Nonetheless, industry analysts fiercely defend the tools used to construct the classifications and they submit them to continuous peer review as a way to win

legitimacy for its results. Statements and their world constitute present attempts to develop “successful world-building activity” and it is developed through activities that seem to be very important for the analysts. Finally, visions let loose are often longitudinal predictions about the future of the industry that are not built nor assessed with the same criteria as the previous ones; their failing does not seem to hurt the reputation of the analysts. Therefore, their effects are limited and tend to run out in the short run, they are more like provocations than strong predictions. In fact, Williams and Pollock have observed analysts openly accepting in public their mistakes regarding long time predictions made in the past, even make fun of them, and not suffer damage to their credibility in return (Williams & Pollock, 2016).

To summarize, Williams and Pollock highlight two important aspects in the study of expectations. First, that we need to focus not only on the apparent effects or propagation of expectations but also in the processes and strategies guiding the production of expectations, and the different contents and time-scales surrounding its variability. Second, it is crucial to examine the different types of expectations being deployed, the specific types of work involved for each one of them, the heterogeneous materials and actors getting entangled in them, and the differential effects and accountability demands they may have across time. I will be taking these two aspects on board for my analysis of Yachay across time, focusing on the work required to achieve personal and collective ties-commitments through expectations, and how they are subjected to different types of accountability at different periods in the life of Yachay.

A third insight into the study of expectations is that expectations show plasticity, they change over time and take longer periods of time to become institutionalized and rooted deeply within a community. Analysing how expectations change, are shaped by particular communities, how they develop across time while resonating with micro social and macro social events and how actors make sense of this complex process can share important insights into the study of techno-scientific projects and their intricate dynamics. For example, Borup et al. affirm that expectation tend to have a “temporal pattering over time”, exhibited through cycles of hype and disappointment

that attract interest to the projects but also set the bars of what is expected from them very high and thus putting pressure over the project (Borup et al., 2006, p. 290).

As Williams and Pollock acknowledge their typology of promissory work is a starting point, and is context specific to the work of promissory organizations. Even so, this does not mean that their work cannot share insights into the analyses of promissory work in other arenas, but rather that it should be taken as preliminary typology, that can orient research and also be informed by further analytical and empirical research through the study of new areas of promissory work. This is why I think it is important to apply their insights to the study of the promissory work involved in a temporarily and spatially large-scale project like Yachay in which expectations are produced and maintained by a large and varied amount of actors while the project is currently in the making. The Ecuadorian state plays a central role in the promissory work made in Yachay, and as Borup et al. affirm the types of justification and legitimacy building required from the public sector is far greater than that required for the private sector as public funds and political authority are being constantly deployed and contested (Borup et al., 2006, p. 295). In the case of Yachay, this is even more relevant due to the size and reach of the enterprise in regard of Ecuador's political history and economic structure: whether the project be unsuccessful or thrives, its outcomes and effects might have a dramatic influence in the country's short and long-term future. As I will explain in the methodological approach, taking into account these insights into the design of the research is very important as it allows developing a framework that is sensitive to the complex coordination practices, the heterogeneous actors, types of work and managing processes in play during the development of a technoscientific project like Yachay.

The next section describes my particular perspective on expectations in order to complement the current literature around them. My framing aims to contribute to a wider understanding of the centrality of expectations in our lives and to gain some insights into how the present, the past and the future are closely interrelated to one another in complex non-linear dynamics.

1.3.5. Expectations as more than futures

As noted in the previous sections, in the literature expectations are mainly understood as “real-time representations of future technological situations and capabilities” (Borup et al., 2006) and have been analysed with a central concentration in their relation to the future (Brown & Michael, 2003; Eames & McDowall, 2010; Tutton, 2011; van Lente, 2012). In this thesis I want to develop a an understanding of future expectations in a complementary relationship with the past, by conceptualising expectations as an interface that marks the constant recalibration between pasts and futures through the present both consciously, personally or collectively, (Konrad, 2006; van Lente, 1993b), and unconsciously (Clark, 2013b, 2016; Pezzulo, Rigoli, & Friston, 2015). In other words, I propose the possibility of understanding expectations not only in relation to the future but also to the past, focusing on the particular modulation of both that is constantly opened in the present where ways of observing-understanding futures are linked to ways of observing-understanding pasts. This is, expectations as representations and observations of both futures and pasts that allow for the emergence of meaningful and actionable presents. In this sense, expectations are the interface in which pasts and futures are modulated and negotiated: actualized in an ongoing interaction with a dynamic present that both shapes and is shaped by expectations.

This perspective assumes that not only our relations to futures but also our relations to the past are problematic and partial, unfinished. Moreover, pasts also require attention, reinterpretation, and readjustment with respect to the contingent conditions of the present and shape our experiences of what can be deemed new and innovative. Expectations can be read as interfaces through which we reconfigure the complex relations between pasts and futures, mobilizing specific understandings and visions of both, which can become strategic resources as I hope to show across the thesis. In short, for every present, the interrelation between pasts and futures is readjusted and a shared actualization of meaning and possibilities for action is

shaped (Fuchs & de Jaegher, 2009; Leydesdorff, 2009; Luhmann, 2006; Miller & Clark, 2018) through expectations.

From this perspective, when analysing these future producing practices we should not only focus on the novelty of the promises, expectations and prospects being constantly produced, but also in how the past; old knowledge, practices, assumptions, symbols, technologies, traditions, stable relations are involved in the process of future making. This would allow us to understand future making practices not only centred on novelty and futuristic modelling of technologies and arenas, but also on how those same processes are influenced by, and influence, the ways in which the past is observed, understood and actioned in the present. Expectations tend not only to be oriented towards how the future is going to be configured but also on which fragments of the past will become in one way or another in part of the future. For instance, expectations show particular connections to the past, playing hopes or fears long-carried by a community as part of strategic work of expectations building. Shaping continuities and discontinuities in respect of the past is a fundamental part of promissory work, as it looks to shape what should be relevant for the future and what is indifferent for it. This understanding of expectations aims to contribute to the call to develop studies on innovation and technological dynamics that aim beyond futuristic-centred analysis, which leave out of sight the roles of the old and the multiple temporalities at stake (Adams et al., 2009; Edgerton, 2008; Murphy, 2013).

Different actors within a single arena perceive and experiment different landscapes and temporalities of the social unevenly; they delineate what local and macro mean not as fixed analytic categories but as relational positions in particular times and sites, based on their own past trajectories and future orientations. This means that those actors perceive different possibilities for action, interaction and opportunities to develop; they also experiment demands and pressures from other segments of the sociotechnical fabric differently and unevenly (Monteiro, Pollock, Hanseth, & Williams, 2012; Sharma, 2014). This is to say that their presents are different precisely because they perceive their possibilities for action, in a sense their “storage of possibilities” or futures, in a different manner based on their own positionalities and

experiences of temporalities. The dynamics of expectations runs through all these layers and connects them. Practices that involve expectations use both personal, collective and infrastructural knowledge that has been sedimented and crystallized in longer time-frames as backgrounds for envisioning, understanding and acting upon the past and the future (Brown & Kraft, 2006; Brown, Kraft, & Martin, 2006).

The next section describes how this take on expectations could allow STS to engage in wider debates around anticipation and why this matters.

1.3.5.1. A bridge to other disciplines

As argued in the beginning of this section, anticipation and expectations are currently being studied from a variety of perspectives and in a multiplicity of disciplines (Beckert, 2013a, 2013b; Nadin, 2016; Poli, 2014). Furthermore, expectations and predictive processes are currently establishing a bridge through which a connection between the cognitive sciences and the social sciences can be achieved, as these anticipatory processes link the realms of the sub-personal, the personal and the collective in ways that previous paradigms could not fully grasp. While the wide social importance of expectations is not new for the literature on expectations in STS (see for instance Brown et al., 2003) this connection with current research in other fields has not been discussed. It remains an unexplored field. My argument here is that in order for STS to take full advantage of the potential critical connections with that literature and other fields, it must broaden the current definition of expectations and include the importance of previous experience, the active relation to pasts, in the constitution of them and in their constant recalibration.

In this sense, recent research highlights the centrality of expectations in human experience, by locating them at the centre of intergenerational processes of socialization and the ongoing cultural negotiation that characterizes humankind (Constant et al., 2019; Linson et al., 2018). For example, academics are developing the theoretical structure and the empirical evidence for the hypothesis of the *predictive mind* (Clark, 2013a; Friston & Price, 2001; Kilner, Friston, & Frith, 2007).

The basic idea is that the brain and the mind should no longer be thought as reactive representational machines continuously fed with sensorial inputs from an objective world through the senses, and then systematically providing outputs as results of cognitive computations (Clark, 2014). Quite contrarily, a continuously growing amount of evidence is showing that the brain and the mind are proactive systems that are continuously trying to anticipate the world in order to minimise prediction error (which could be crudely translated into cognitive surprise) (Clark, 2012; Kilner et al., 2007). The mind is able to do so by deploying predictions, past-acquired knowledge that the brain has condensed into “priors”, which meet every wave of incoming sensory input with expectations based on existing personal experience and knowledge about the world acquired through both ontogenetic and phylogenetic learning processes (Clark, 2015b; Friston et al., 2012a).

Some interesting consequences of this understanding of the mind that resonate with the present discussion in STS around expectations are the following. First, perception is no longer understood as a simply representational process: mirroring the outside world through the senses and building representational models of the world piece by piece from fragmented sensory input on the base of thought laws; but rather as a fundamentally constructive, highly conceptual and proactive process (Clark, 2015). Second, being able to observe the new is only possible because of the continuous deployment and readjustment of the old, the already known, which is contingent and historical. This is achieved in a downwards hierarchically organized fashion through prediction cascades. In addition, the present itself is also already conceptually charged, filled with historicity, as unconscious emotional, conceptual and attention-bound dynamics precede perception itself (Barrett & Bar, 2009; Clark, 2017; Miller & Clark, 2018). It is on the base of the past and the continuous deployment of the predictive future-oriented hypotheses through which we are able to observe a meaningful present. Third, anticipation plays a central role and it is deeply entrenched and embodied in cognition as predictions modulate cognitive activity in the short run, in fast time scales (perception) and also in the long run, in slow time scales (perceptual learning) (Friston & Frith, 2015). In other words, future oriented

knowledge is enrooted in our bodies, in our understanding and partial experience of past, and in the ways we activate our historically learnt knowledge from the world. STS could contribute critically to the debates surrounding anticipation in this and in a wide set of disciplines, an extension of the current understanding of expectations to recognize the importance of pasts could help prepare the discipline to do this.

The understanding of expectations as interfaces between pasts and futures will be further developed and applied to my empirical data across the thesis, but especially in Chapters 3 and 4 where I describe the roles expectations had in the emergence, early design and implementation of Yachay. The following section continues the theoretical discussion, now setting sight in the literature around infrastructures and their study.

1.3.6. Infrastructures and their temporalities

This thesis follows the life of Yachay as an infrastructure across time, putting special emphasis in the infrastructuring practices on its configuration at different moments. But, what are infrastructures? Infrastructures have been described as the “foundational” systems or technologies on which we operate, this means as those elements without which sociotechnical phenomena cannot work, those elements on which activities depend on and that serve as a basic structure to build upon (Larkin, 2013a; Star, 1999). In this respect infrastructure constitutes the many times “trivial” and invisible material substrates that sustain social life such as electrical and gas systems, water pipes, cables and internal critical arrangements in buildings, roads and sewage, among others. Furthermore, infrastructures are not just things but context dependent relations that are made to function as basis for different kinds of activities and technologies. Thus, providing actors, in a particular time and for particular tasks, a material substrate for their activities (Edwards, 2003a; Star & Ruhleder, 1996). As a result, as social dynamics changes and incorporates new technologies and practices evolve, some of these technologies become foundational. For instance, the internet is nowadays the substrate of a wide variety of social activities and itself is dependent on its own infrastructures, such as a geographically

dispersed data centres, search engines and the internet's addressing and naming system (Mueller, 2002; Sandvig, 2013). Then, tracing the processes of emergence of these practices demands to take into account wider dynamics,

Understanding the nature of infrastructural work involves unfolding the political, ethical, and social choices that have been made throughout its development" (Bowker 2010 quoted in (Sandvig, 2013, p. 94)

In connection, temporality and anticipation have also informed the study of infrastructures through the analysis of design and planning practices that embody in the present long-term visions of durability, stability or innovation -which are never guaranteed (Abram, 2014; Connell, 2009). According to STS scholarship, *infrastructures* are both material and symbolic networks that support various kinds of agency, transportation and flows by providing contingent stability to social phenomena; granting a temporary order to communication and coordination across time and space while remaining mutable and, in many cases, hybrid (Edwards, 2003b; Larkin, 2013a). Innovative infrastructures often "require novel responses in human organization, technical support, and institutional reform" (Ribes & Finholt, 2009, p. 394) while also acting generatively by sustaining new arrangements with unpredictable effects (Amin, 2014; Jensen & Morita, 2015). Importantly, the idea that infrastructures develop through a dynamic process scholars have referred to as *infrastructuring* (Bossen et al., 2014; Pipek & Wulf, 2009) is critical for this thesis. This idea aims to capture the variety of knowledges and labour that enable setting in the present some of the foundational elements that will allow a variety of systems to operate in the future; actors incorporate multiple timeframes, into the design, reconfiguration and material implementation of infrastructures in the present. Importantly, infrastructuring puts emphasis on the activity rather than on the often-intuitive stability of infrastructures, and it highlights the importance of taking into account the agency of multiple actors beyond the initial designers in the shaping of infrastructures across time (Pollock & Williams, 2010a). This thesis focuses on how

these dimensions interact in the case of Yachay as an infrastructure, as it follows its infrastructuring across time and different settings.

Moving on, current accounts of infrastructures have stirred beyond the classical northern European and North American cases and started to study these dynamics in other parts of the world. Some in areas of “the global south” encountering very different situations that not always fit with the characteristics adjoined to infrastructures in the classical cases (Furlong, 2014; Gupta, 2015; Lancione & McFarlane, 2016). These studies have highlighted interesting characteristics such as the heterogeneity of infrastructures in the global South where in many cases uniformity in access and constant availability of water, waste infrastructure, sanitation, electricity and other taken for granted resources is not the rule (Furlong, 2014; Lawhon et al., 2018). These scholars have also focused on aspects of infrastructures often foregrounded in the classical studies. Aspects such as the fundamental role played by maintenance/repair in constantly sustaining operating infrastructures throughout all sociotechnical spheres and geographies (Graham & Thrift, 2007; P. Sormani, Bovet, & Strebel, 2019). Be it information arrangements within a highly complex transport system (Jérôme Denis & Pontille, 2015) or an irrigation system vital for a whole country (J. Barnes, 2017). These studies have also foregrounded aspects related to the breakdown and abandonment of infrastructures, by highlighting the constant danger and presence of breakdown that can often end in disrepair/decay of infrastructures, pointing strongly to the contingency of this complex assemblages within the unfolding of challenging political and economic settings (Jensen & Morita, 2015; Schwenkel, 2015). Moreover, processes of *maintenance/repair, breakdown/disrepair* constitute particularly strong empirical and analytical observational points for developing an integral understanding on the complicated dynamics of infrastructures which at times become visible or evident only “upon breakdown” (Furlong, 2014; Graham, 2010; Howe et al., 2015; Pipek & Wulf, 2009) and whose order is always vulnerable and contingent,

We can instead accept to break with a definition of material order as a “once and for all” stabilized state and recognize the importance of maintenance work in the ceaseless performance of a stabilized world (Jérôme Denis & Pontille, 2015, p. 15)

Chapters 4 and 5 will draw on this literature and expand on the connection infrastructuring practices have with expectations and other temporalities such as political rhythms and the specific practices of repair conducted in the early implementation of Yachay. Although temporality and anticipation are part of the scholarship in infrastructures, I argue below that the concept of *expectations* can help capture more thoroughly the temporal complexity in projects as Yachay that are situated in highly unstable contexts where the processes of *maintenance/repair*, *breakdown/disrepair* have shaped the project from the beginning. This is the case of Yachay emerged with the intricate history of Ecuador and the dynamics of the last 12 years of Government as background. I will explain these economic and political elements in detail in Chapter 3 focusing on the temporal politics of Correa’s 10-year government.

In order to capture the intersection between infrastructures and expectations, in Chapter 5 I draw on the concept of *compressed foresight* (Schuyter & Calvert, 2015; Williams, 2006) to track the dynamics of Yachay EP and YachayTech once inaugurated and facing the weight of the evaluation of the early expectations. I will introduce the concept briefly here and develop it in detail in Chapter 5.

The concept of compressed foresight was developed to analyse the development of nanotechnology along with the ways in which the visions of its future applications and societal effects were taken for granted and assumed as already determinate and forthcoming from both its proponents as from those critical to those high technology futures (Williams, 2006). In this way futures were assumed to be, not only discernible from the beginning and thus generating a deterministic understanding of innovation and technological evolution, but these futures ended up being compressed into the present. Later it was applied to the emergence of the field of

synthetic biology to analyse how promises mobilized by certain groups within the field regarding future applications and economic potentialities ended up hurting the field's required infrastructural investment. This happened because the generated expectations on public policy level themselves put pressure on the actors within the field to deliver advances and results in a very short time scale, mostly in economic terms, and overlooked the required investment to secure the field's long term development (Schwyter & Calvert, 2015).

1.3.7. Relational infrastructures

From the start infrastructure studies have been interested in understanding the social and political dimensions of infrastructures that are entangled and develop hand-in-hand with the cables, roads, pipes, concrete beams and other constituents often associated with them (Edwards, 2003b; Star, 1999; Star & Ruhleder, 1996). Furthermore, authors have argued that infrastructures are interesting study objects precisely because one can perceive through them important dimensions of social life, and gain insights into the materiality of political processes and their connection to governmental strategies (Carse & Lewis, 2017; Scott, 1999). Larkin for example argues that studying multiple "forms of infrastructure can offer insights into other domains such as practices of government, religion, or sociality." (Larkin, 2013b, p. 328). Currently, there is a heightened interest in how closely coupled are sustainable infrastructuring practices to modes of administration, governance and response to infrastructural heightened stress or failure (Thacker et al., 2019). In this line, based on my empirical evidence from Yachay I propose the concept of relational infrastructures, which I develop across the thesis, and especially in chapter 5, to capture a sociopolitical dimension of infrastructures.

The concept of relational infrastructures seeks to encompass the notions developed in the previous sections around infrastructures, namely its foundational and contingent stability that depends on complex and changing relations, their context embeddedness and its vulnerability to breakdown and disrepair while maintaining a need for maintenance and care. Moreover, it highlights relationality, and how

actors/materials incorporated into the project bring with them already present relations from their recent and long pasts, mobilize futures, expectations and particular readings on contexts which in turn shape futures and the practices involved, and hence the processes of materializing expectations through infrastructuring practices materially and symbolically that generate contingently stabilized infrastructures. It highlights a dynamic ecology of which infrastructures are the most stable part but that coevolve along with expectations, contexts and practices.

Through this perspective an assemblage of heterogeneous materials is assumed as conforming infrastructures, different types of actants human and not human conform these assemblages, but in addition to actants, relational infrastructures points to the relationships that are also being assembled. Relationships that are not always visible and conform parts of the trajectories of the actants or materials that form the assemblages. It aims to highlight the historical depth of the actants and materials involved, and how these are already configured by other relations which provide them with greater or lesser stability. These relationships can be between human beings for example social networks, they can be between institutions, between matter (which highlights the vulnerability and vibrancy of matter), between infrastructures (the internet and electric systems for example) or different legal devices such as the national constitution and the national plan of good living in the case of Ecuador's government, between practices (the spheres of construction and oil in Ecuador) forms of negotiation. The idea is that these relations come into the project along with the actors, practices and materials involved, and the effects of such incorporations cannot be easily predicted.

The point is to emphasize that when carrying out a new infrastructural project as Yachay, not only materials that were already present are used, reconfigured, but also that sustained relationships, actualized through time, are assembled.

In addition, this approach aims to trace Yachay's emergence within and alongside the dynamics of political and economic spheres in Ecuador during the last 12 years.

Dynamics, which in themselves incorporate narrative and relational infrastructures whose trajectory resonates and connects with longer-term historical legacies from Ecuador's past. An example of these is the *buen vivir* and *sumak kawsay* paradigms and the recognition of the unpaid "historical debt" (León, 2008; Paz y Miño, 2004; Vanhulst & Beling, 2014). Accordingly, this connected me to actors and resources that are no longer present at the project but that were fundamental in its planning and in its initial achievement of political and economic support. These actors' perspectives and the documents they directed me to, gave me insights into the multiple actualizations the project had lived through even before it became public and the temporal dynamics that were already in place.

Currently scholars are explicitly studying the temporal dimensions of infrastructures, with a lot of the focus being put on future-making practices and how governing strategies are based on infrastructures (Edwards, 2003a; Haines, 2018; Penelope Harvey, 2017). Interestingly, other authors have put emphasis on other temporal dimensions of infrastructures beyond futurity. For example, their role in embodying and stabilizing specific timescapes (Chapter 4 provides a full explanation of this concept) even when these may entangle temporalities in tension (Joniak-lüthi, 2017); as well as exploring the multifarious politics of temporal transformation around infrastructures by studying "projects that were proposed but shelved or pursued but abandoned, research on the unbuilt and unfinished can be a focal point for understanding the "embryonic contemporaries" of previous eras and the suspended futures of the present." (Carse & Kneas, 2019, p. 23).

My argument is that in order to explore more fully the temporalities of infrastructures there is a need to complement these approaches with a temporal approach both to study infrastructures across time, like the BOAP proposes (Hyysalo et al., 2018), which would study not only the unfinished or decay moment of an infrastructure but its life more integrally. In addition, to a complementary study of relational infrastructures, of the temporal layering of relations that support the emergence, reconfiguration and even the demise of infrastructures. If these components are not taken into account, then the complex and contingent temporal dynamics shaping the

infrastructures across their lives may be obscured, thus an explanation of why they emerged in the first place and what precisely happened could be overlooked taking preference for narratives of achievement or demise. This is the risk of studying single entry points into the infrastructures' life and not trying to study temporalities temporally. This thesis aims to contribute to a temporal analysis of infrastructures by following Yachay across its life and analysing the different temporalities coming together in the project along with the different actors shaping its dynamics over time.

1.4. Conclusions

This chapter has introduced the general thesis by describing both my case study and the theoretical approach I have taken for this research. Its main aim was to introduce the reader to the case of Yachay highlighting the significant political and economic dynamics of which it is an active part, and to present the key conceptual tools I will be using across the thesis to analyse it. The chapter has discussed in detail my approach to both expectations and infrastructures, extending specially on a theoretical discussion of the first and the associated analysis of temporalities and futures within the social sciences and more importantly in STS. The next chapter will focus on describing how this theoretical approach connects to my methodological approach. The BOAP, which guided my methodological orientation, will be introduced in detail and I will explain how it also shapes my theoretical framework. I will recount my fieldwork conducted during different periods between 2016 and 2018 and reflect on the limitations of the study.

CHAPTER 2. Methodology

So far, I have delimited the theoretical framework of the research while providing a general context to understand Yachay. This chapter divided into 4 sections dealing with the methodological approach of the research. I start by describing the principal components of the BOAP approach and explaining how I have applied them to my research on Yachay. Afterwards, I discuss how to study temporal phenomena in STS through the notion of context. To do so, I problematize the notion of context and introduce the way I will be dealing with it across the thesis. The following section provides a synthesis of my fieldwork related to my two different entry points into the life of the project and highlights the limitations of my investigation. Finally, I provide conclusions for this chapter and introduce the following ones.

2.1. Research design(s) and Methods

My research is guided by the *Biography Of Artefacts and Practices (BOAP)* approach which has developed hand-to-hand with the notion of *strategic ethnography* (Hyysalo et al., 2018; Williams & Pollock, 2012). I use the BOAP approach to understand the multiple roles of temporalities, the specific characteristics they have and the sets of relations of which they take part in Yachay. The BOAP approach involves collecting data throughout different moments and sites in the life of the artefacts and studying them along with the different practices shaping them. In my case, this implied the different sites in which Yachay was being infrastructured as a sociotechnical project, and the variety of entangled practices implicated in its construction. With this objective in mind, I have collected data about the creation and design, the intra-governmental consolidation, the ongoing implementation of the project and the reconfigurations Yachay has gone through its life.

Through a strategic ethnography orientation (Pollock & Williams, 2010a; Williams & Pollock, 2009) I have simultaneously aimed to take advantage of emerging contingent opportunities, while keeping awareness and reflecting on the effects of my chosen

methods and the timing of my research on what I was able to observe at a given moment, and how this influenced my results. Although I initially thought of my study as remaining within the boundaries of a single site study, this conception has changed during my fieldwork as I have moved through different sites, within Ecuador and internationally, to follow the different actors and trajectories at stake. These changes were possible thanks to the open-endedness of the strategic ethnography approach, so while remaining focused on Yachay, it enabled me to follow the ramifications of its relational infrastructures.

As mentioned in the introduction of the thesis, the argument presented across the thesis is based on my fieldwork in Yachay carried between 2016 and 2018 for 14 months. The fieldwork had two different moments. First, when Rafael Correa was still president, and the second, after Lenin Moreno had entered office in 2017. I conducted non-participant observation in both of Yachay EP's offices in Quito and in Urququí, in different areas of YachayTech, in the communities located within Yachay's perimeter of intervention and in the town of Urququí (see the location of the project in Ecuador in the figure below). Additionally, I led 85 in-depth interviews developed in different locations across Ecuador, in Belgium and through video-calls with people across different parts of the world. Through the interviews, I encountered multiple actors involved in Yachay, directly or indirectly, at different stages. My interviewees had a variety of roles in the project. For instance, current and previous authorities from Yachay EP (EP - the public enterprise in charge of planning and building the infrastructures of the city of knowledge) and YachayTech (the research-oriented university planned to be the heart and motor of the project). Also, public servants of the two institutions both current and from the past, students and lecturers of the university, local community members and leaders, entrepreneurs and public authorities. The interviews and the observations were complemented with document analysis of public and private records, as well as a sustained following of the project's development from its early stages and during the course of significant events in its life. Section 3 of this chapter will expand on the use of these methods and my experiences during fieldwork.

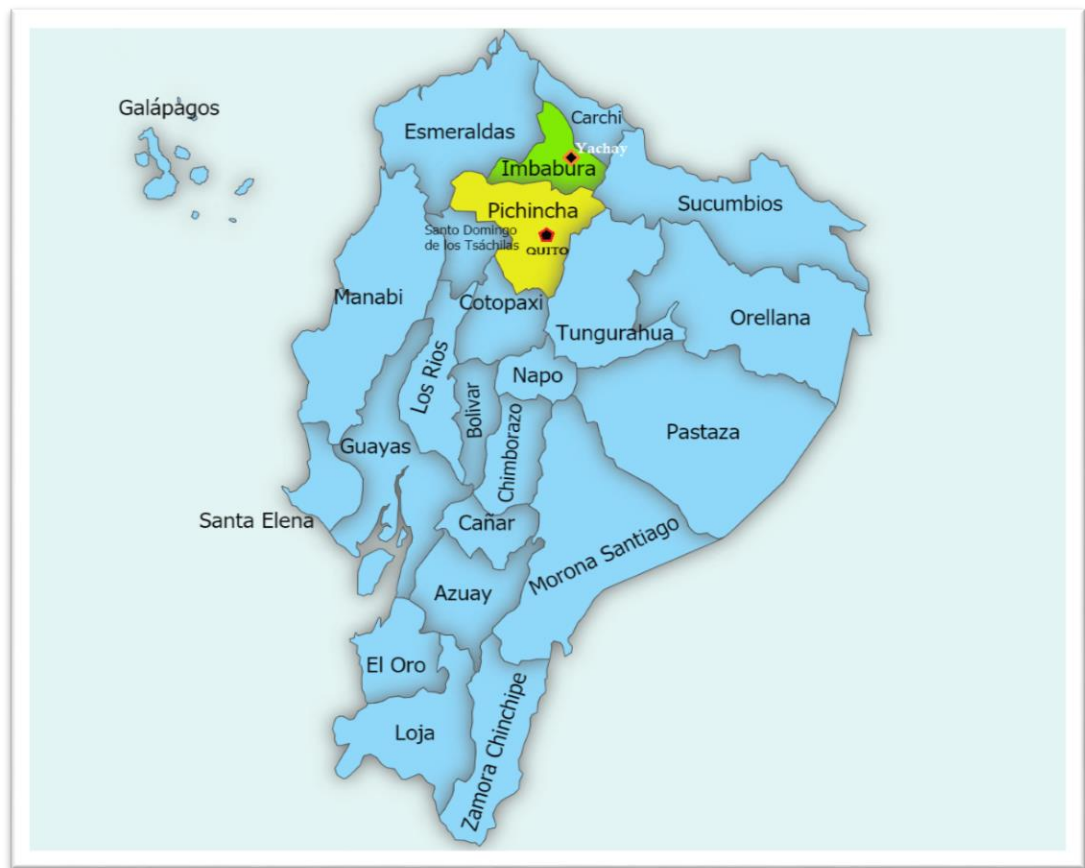


Figure 3. This map of Ecuador that shows Yachay's location in the province of Imbabura, north of Pichincha where the capital of the country Quito is located. Most of my fieldwork was conducted in these two spaces and in the transit between them. (Source: the author).

2.1.1. BOAP, strategic ethnography and temporalities

My selected methodological framework, the Biography of Artefacts and Practices (BOAP), is focused on understanding technological innovation not as a linear and stable process, but as a constant configurational process devoid of certainty of arriving at an optimum final stage or achieving the exact visions delineated at the beginning. It studies sociotechnical phenomena throughout time and in practice, in parallel with the diverse range of social relations and settings wherein they evolve. The aim to follow the life of technologies in practice along with the contingent elements shaping them. It studies technologies and practices from early design stages into implementation and unravelling reconfigurations. It is in itself inspired and works with ecological approaches to sociotechnical innovation and knowledge, and multi-

sited ethnographies (Abbott, 2005; Akera, 2007; Marcus, 1995). Now I will describe how these principles connect with my analysis and how I try to implement the multitemporal approach that characterizes the BOAP.

Through their approach to strategic ethnography, Williams and Pollock expand the traditional ethnographical perspective of STS with a more comprehensive theoretical background and a *multi-level analysis* that are fundamental to understand and follow the different temporal and spatial dynamics taking place during a single sociotechnical phenomenon. This approach draws on previous ecological approaches to sociotechnical phenomena (Abbott, 2005; Akera, 2007); it also responds to academic calls to extend the classical approach to ethnography and extend its scope both temporally and spatially (Heath, Koch, Ley, & Montoya, 1999; Hine, 2007; Marcus, 1995).

In fact, Williams and Pollock have used Hutchins' cube (Hutchins, 1995) and Sampsa Hyysalo's *multi-historical time-frames framework* (Hyysalo, 2004, 2010) as inspirations to highlight the need for a multi-level analysis that encompasses two central elements. One, the heterogeneity of times, of speeds of development, learning and change. And two, the recognition and description of artefacts' constant coevolution. Their intent is then to develop a perspective that can address both immediate contexts of action and interaction, while making visible the "unfolding of multiple histories" and "address multiple historical time frames" (Williams & Pollock, 2012, p. 13). The authors argue that one should tackle the research of sociotechnical phenomena through a complex, relational and multilevel analysis that allows the study of more than one register of analysis, different levels/tempi and the "opportunistic and strategic" composition of different depths and centres of focus. The authors also argue that we should not get locked into particular methods or modalities of research but rather seek to remain aware of the "multiple historical registers that surround a particular phenomenon" (Williams & Pollock, 2012, p. 15). Expectations, as presented in the previous chapter, could be a great object of study to connect these different levels/tempi of analysis.

Following this line of thought, I have tried to capture this simultaneous development of multiple durations by alternating the narrative voice I use to describe my findings and analyse Yachay throughout the thesis. In some sections, I adopt a “bird’s eye view” trying to describe institutional arrangements and the dynamics of Yachay from a wide perspective. In others, I focus on specific events I witnessed (see figure 4) or interactions I had during my fieldwork in order to direct attention either to actor-centred dynamics or to more immediate dynamics. This alternation by no means is sufficient to capture the full scope of the multi-level dynamics developing at different time-scales, but I do hope it helps to address the limitations of my study. Additionally, my aim is that this approach helps to portray how issues often portrayed as a matter of scale can be thought as a problem concerning partial, situated perspectives. Take for example the macro dynamics of the Ecuadorian state with respect to the micro dynamics of everyday work in Yachay. The relation between these two spheres can be understood not only as a matter of macro/micro dimensions, with one shaping the other in a unidirectional manner, but as a division connected to the researchers’ own points of foci, and how these interact with the specific positionalities of actors, and the interconnection of multiple durations in one phenomena.



Figure 4. A picture I took of one of the events in Yachay of which I took part, besides actor's from YachayTech and Yachay EP I met there community leaders, reporters from several news media and special guests from the private sector. The picture is from 2018 on the day Yachay's supercomputer was officially inaugurated.

For example, I have tried to capture this aspect of my research by interviewing actors that perceive each other as sometimes belonging to different scales of action, for example as being part of macro dynamics outside their range of action. A particular case is that of ex-president Rafael Correa who many actors in Yachay perceived as belonging, or even representing, the big state, the macro structure and dynamics of the state with which it was often impossible to negotiate, rather, one had to adapt to it. He was a stable point of reference for actors but a point that remained outside of their own scope. When I interviewed him, I was able to observe how the relation that previously appeared as one of macro/micro, was a matter of the positionality of the actors, their transit through different spheres and their influence over specific aspects of the project. While Correa could influence the accountability regimes of Yachay EP, from his perspective he could not do much about the daily operations and how the contingent aspects of the present were dealt with. His orders were always mediated and his own information about the project depended on other actors. Even

when he was the president and represented somehow the power of the Government, he too had blindspots and a partial perspective of Yachay. For all actors, from their own partial perspectives there were always elements of Yachay and beyond that they could not control or shape at their will.

In this sense, my methodology enables me to combine different levels of analysis, as the BOAP approach recommends, from looking at the different economic and political cycles of Ecuador and how Correa disrupted them (macro) (see chapter 3), to empirically follow Yachay's workers through their daily routines (micro) (see chapter 5). However, it also problematizes these dimensions as a matter of positionality and the constitution of contexts for the actor's own actions. The narratives emerging from these in-and-out processes represent the different trajectories and temporalities converging around Yachay. This resonates with how BOAP proponents argue in favour of accounts that combine various scales of analysis. In their words,

Pursue research at multiple temporal and spatial *scales*. BOAP is at odds with accounts that assume sociotechnical change could be adequately understood through a 'birds-eye' descriptions only. There is a need to bridge between the analyst's bird's eye view and the actors' real-time 'frogs' eye' perceptions, which typically feature high levels of uncertainty and contingencies (e.g. the 'fog of innovation' (Höyssä and Hyysalo, 2009)) that can entirely disappear from historical data and broad overviews. (Hyysalo et al., 2018)

Another one of the central premises of the Strategic ethnography approach is that one should reflect on how the choices made during the research design of the study may shape the findings. Williams and Pollock argue in favour of a "theoretically informed" decision making in the process of selecting locales, sites of study and points of entry into the sociotechnical arenas. This is valid for the space or spaces one chooses to study, the length of the time frames selected and the conceptual tools

used to highlight particular aspects. All these choices can have profound impacts on the robustness and depth of explanation, emphasizing some factors and effects, while making others invisible and unconnected. Furthermore, reflexivity and accountability in the decision-making during the research design are important themes in this perspective and I consider them vital for my own research. In addition, I want to use the research of my PhD as the first entry on the biography of Yachay, and develop the theoretical and methodological tools that will allow me to follow its life in the years to come.

The strategic approach suggests making different entry points both in time and in space in order to understand the biography of an artefact. For instance, one should not only focus on “snap shot” studies of the implementation stage of a particular artefact in a specific site and derive general conclusions about the life of that artefact from that single and short-term entry point. One ought to try to take into account the design process as well, and the ways in which in longer periods after implementation, users tend to domesticate and innovate while adapting the technology to their particular point of application and their specific aims. This may obscure the longer-term relationships regarding alignment and organizational readjustment. Hence, the spatial and temporal framing of our research already shape the slices of sociotechnical fabric we are going to be able to observe. Furthermore, it predisposes our tools for rather complex or reductionist approaches that may range from atomistic actualism to presupposing structural determinism. The authors phrase it this way: “choices about the temporal framing of enquiry have important implications for what may be viewed... ...the research design choices we make are to be centrally addressed also parallel our choices regarding the adoption of a local or more global gaze” (Williams & Pollock, 2012, p. 14). Similarly, Kaniadakis flags the researcher’s need to reflect on the specific actor’s “viewpoints” framed as bounded understandings of the settings in which they are immersed, and how they use them to navigate in those specific contexts and act in them (Kaniadakis, 2012).

Considering these points, I developed my research through *different entry points* to Yachay in different stages. This was complemented by a historical approach that

enabled me to follow the project's development through different kinds of communication media since the beginning of my research. In this sense, my investigation has been inspired by a historical sensitivity that I have used to complement my present-oriented exploration of the practices in Yachay. This has allowed me to follow the project not only in its ongoing implementation stages but also into its past and the interlocking political and economic contexts mobilized and interpreted by the actors involved. This has conducted me to sites, documents and cases from which Yachay draws inspiration, such as Louvain-la-Neuve in Belgium and Daedeok Innopolis in Daejeon, South Korea. Then, leading me to observe how different imaginaries and narratives contained in the configuration of Yachay have a complicated history and a lively present travelling around the globe (Joss, 2010; Joss & Molella, 2013; Kargon & Molella, 2008a).

In the case of Yachay, the use of this approach will allow me to remain aware to both the localized and heterogeneous characteristics of the case, while maintaining a more systemic view of the multiple historical contexts in action and the patterned and aggregate features that connect Yachay to other sites in the present and in the past. Similarly, following this framework, expectations should be framed in their longer durations, not only as extending into the future, but as also drawing into particular features of the past. Tracing these temporal gazes in their longer durations can allow the research to trace more effectively both the ruptures with the past as well as continuities and revitalization of trends or imaginaries already in play in the past.

Seen from this point of view, historical research is complementary to strategic ethnography. In Yachay a diverse array of actors, institutions and collectives are involved in practices, ranging from political actors to students and scientists. In a way each one of them are developing particular tasks, gaining knowledge, experience, time and resources for their own professional careers and personal trajectories, while also taking part in the constitution of processes of longer duration such as the intergenerational development of scientific practice, research and innovation. Furthermore, each one of them is also taking part in the historical development of one type of technological field: that of Technocities and technoparks, while also being

involved in the contextualized, patterned, and continuous struggles and negotiations around the role of science in Ecuador, and more generally in Latin American societies.

In fact, consciously or unconsciously the choices made by the planners and actors involved in Yachay's promissory work are also taking part in the constitution of that particular trade, that of the anticipatory gaze and the promissory work around configuring new technoscientific enterprises. Interestingly, Yachay is already being considered as part of the baggage of projects, visions and models that politicians and entrepreneurs take as reference or try to mimic in other parts of Latin America for example Perú and Colombia. Therefore, the ways in which technology, the past and the future are observed and mobilized in Yachay play also a part in the constitution of a future-oriented practice that has been sedimenting for decades or maybe even centuries.

If we zoom in to the local then we can see how Yachay is also immersed in Ecuador's economic and political history, how the government is mobilizing around it not only promises about a technologically stimulating future but also promises of redemption recovering ancient principles and practices from the "sumak kawsay". In order to look at the future, Yachay turns its gaze into the past. Then, the future is not only promoted as a time and place for innovation and advance, but also as a time and place for justice, redemption and restitution (for instance, the *historical debt* mentioned in chapter 1). Likewise, Yachay is pointed as the place in which the past comes to life, not only as burden as in Marx's famous dictum, but as a constitutive force for Ecuador's future. All these aspects tie promissory work not only to the ways in which futures are imagined, performed, contested and abandoned; but also to how present day expectations relate to the trajectories coming from the past, to their continuities and possibilities for reappearance. Therefore, I have incorporated historical inspiration for my approach, as a way to map and follow the different trajectories that converge in Yachay, and understand how actors, materials, discourses and collectives that come from the past are integrated into the configuration of this new technological project.

In addition, this historical approach has allowed me to trace Yachay's emergence within and alongside the dynamics of political and economic spheres in Ecuador during the last 12 years. Dynamics, which in themselves incorporate narrative and relational infrastructures whose trajectory resonates and connects with longer term historical legacies from Ecuador's past. An example of these are the *buen vivir* paradigm and the recognition of the unpaid "historical debt" (León, 2008; Paz y Miño, 2004; Vanhulst & Beling, 2014). Accordingly, this connected me to actors and resources that are no longer present at the project but that were fundamental in its ideation and in its initial achievement of political and economic support. These actors' perspectives and the documents they directed me to, gave me insights into the multiple actualizations the project had lived through even before it became public and the temporal dynamics that were already in place.

Hence, following the BOAP approach allowed me to trace the history of Yachay in the making, while connecting this history with Ecuador's contemporary shifts and the events that have shaped both, and been shaped by them, in the last 12 years. Following Yachay across different sites and times that have marked its ideation, deployment and actualizations has helped me to understand the internal and external dynamics shaping the project and the multiplicity of roles and ways in which temporalities are significant to its current state and projection into multiple futures. Furthermore, unexpectedly, this framework has also allowed me to observe how the dynamics of infrastructuring, actualization and maintenance overlap with those of decay, dismantling and breakdown (Furlong, 2014; Jensen & Morita, 2015) in a very complicated setting as the contemporary Ecuadorian one.

In the next section, I will discuss the approaches within STS to the study of temporalities and my positioning in the debate. I will be focusing on the shortage of discussions around how to study sociotechnical phenomena not only temporally, but how to focus on temporal phenomena in themselves as remarkable social elements.

2.1.2. Contexts, temporality and the BOAP approach

I started my research wanting to study temporal dynamics in sociotechnical projects, particularly expectations, and how these are mobilized shaping their development. Recent scholarship in STS has taken time and temporalities as a relevant topic of enquiry, as the previous chapter described there have been a variety of studies locating expectations, anticipation practices and the use of futures as vital resources for techno scientific enterprises and beyond (Borup et al., 2006; Selin, 2008). Others have discussed temporal phenomena such as the acceleration of social life through an STS lens focusing on concrete practices and lived temporalities, for example scholars such as Sarah Sharma have analysed the intersections between the social shaping of temporal dynamics, the division of labour and the transformation of inequalities (Sharma, 2008, 2014). In short, research and analytical frameworks around the study of time have developed in STS in the last decade or so. Nonetheless, one of the issues scholars in STS have discussed less around the topic of time, and is arguably one of the main challenges when studying it, is how we should proceed to study time in a significant manner. Namely, the practical matters when doing research around time regarding how one should outline the research design, which principles to pursue while in fieldwork, and how/where to observe temporalities are not explicitly discussed in detail and remain underdeveloped themes⁷. This is tied to wider debates in the field around methods, the complexity of studying messy social phenomena and the search for more robust and responsible accounts of both the people we study and the effects triggered by ourselves through the ways in how we study phenomena (de la Cadena, 2017; Hyysalo et al., 2018; Law, 2004).

I argue that in STS the debate, and sometimes lack of debate, around time has been closely related to the debate around the notion of context. This is a topic I already discussed in the previous chapter, but I will define the general traces in the following paragraphs so I can relate it to my methodological design. There has been a

⁷ A very interesting exception is (Czarniawska, 2004) who discusses the interplay between chronological time and kairotic time in the accounts of both the actors within an organization of their own activities and the history of the organization, and of the researchers themselves.

longstanding debate, considering the age of STS as a field, around the role and value of contexts as explanatory resources. This debate has been tied closely to the development of Actor Network Theory –ANT–, as it were scholars closely related to it who developed a systematic critique of traditional sociological analysis using terms such as society or context to explain particular social phenomena. In the words of Bruno Latour: “society is the consequence of associations and not their cause. (...) social is not a place, a thing, a domain, or a kind of stuff but a provisional movement of new associations.” (Bruno Latour, 2005, p. 238). These situated contexts as problematic concepts brought into the table a paradoxical relation with the notion of context. On the one hand, STS scholars tried to develop a more fine-grained and sensitive perspective on the forces in the present actually constituting phenomena, constructing a set of theoretical and methodological tools that would allow them to do so. This is the case of much of the literature developed in the last decades that resonates with ANT and material semiotics which has developed a strong set of tools to detect and handle difference (Law, 2016; Mol, 2010).

Even so, on the other hand, if not accompanied by a problematization of the notion of context this move could mean a loss in temporal depth, which could endanger these studies by letting out of sight deep historical dynamics and more stable relations. Power relations not being the less important among these. For these reasons, ANT has been critiqued as being flat, obsessed with the present and politically innocent. Even so, some of the most influential research pieces by ANT theorists have been historical in nature, see for example (Callon, 1986; Bruno Latour, 1995; Law, 1984), but they have not taken temporality itself as an object of study. By trying to problematize society, they unpacked the spatial dimension of context via their fine-grained approach, but left the temporal dimension out given that they only did fine-grained descriptions of what they could observe at that place, in the relevant situation and through the actors they decided to follow. In this Latour’s fragment, we can see these elements coming together onto a provocative conclusion:

there is nothing specific to social order; that there is no social dimension of any sort, no ‘social context’, no distinct domain

of reality to which the label 'social' or 'society' could be attributed; that no 'social force' is available to 'explain' the residual features other domains cannot account for; that members know very well what they are doing even if they don't articulate it to the satisfaction of the observers; that actors are never embedded in a social context and so are always much more than 'mere informants'... ..and that 'society', far from being the context 'in which' everything is framed, should rather be construed as one of the many connecting elements circulating inside tiny conduits. With some provocation, this second school of thought could use as its slogan what Mrs Thatcher famously exclaimed (but for very different reasons!): 'There is no such a thing as a society.'

(Bruno Latour, 2005, p. 5)

My research aims to contribute to this topic by analysing the temporal dimension of contexts and by problematizing the notion of context in the case of Yachay. Taking this into account, the fine-grained approach to social phenomena developed across ANT, and more generally in contemporary STS, is very useful as it pushes against generalizations that may obscure the practice-driven approaches of STS. I want to discuss how the critique of the traditional notion of context from an ANT perspective⁸ could be complemented, and some of the temporal problems engrained in it could be solved, by situating it within a different methodological framework, that of the BOAP approach (Pollock & Williams, 2010a; Williams & Pollock, 2012).

⁸ See for example: "Contextualists start from the principle that a social macro-context exists - England, the dynastic quarrel, Capitalism, Revolution, Merchants, the Church - and that this context in some way influences, forms, reflects, has repercussions for, and exercises pressure on 'ideas about' matter, the air's spring, vacuums, and Torricelli tubes. But they never explain the prior establishment of a link connecting God, the King, Parliament, and some bird suffocating in the transparent closed chamber of a pump whose air is being removed by means of a crank operated by a technician. How can the bird's experience translate, displace, transport, distort all the other controversies, in such a way that those who master the pump also master the King, God, and the entire context?" (Bruno Latour, 1993b, p. 21)

As multiple scholars in STS have argued (Bakker et al., 2011; Borup et al., 2006) one of the effects of expectations is the connection of the different levels of the social. Individual actors have *situated and partial observation points*, constituted by their relational historical trajectories that shape how they perceive actors, institutions, collectives as well as macro-meso-micro levels of social life, and in connection to those particular contexts their own possibilities for action and advance. This means that different actors with different relational positions in a particular technoscientific arena will have different perspectives on which sections and actors of that arena can be transformed or negotiated with, and which ones are more stable and less susceptible to modification.

Observing the co-evolution of these different levels/tempi of analysis is possible by understanding practices as co-constituents of the contexts in which they are performed even when these change at different speeds. Williams and Pollock refer to this perspective as a way of “looking more systematically at the range of interlocking context in which sociotechnical phenomena emerge and evolve” (Williams & Pollock, 2012, p. 12). In this sense, there is no clear separation between the practices being unfolded and the “outer context” surrounding them, they are all happening at the same time but with different durations, sedimentation effects and speeds. In Hutchins words: “The crux of the matter is that these are not different layers of context, as they all take place in one and the same process” (Hutchins, 1995, p. 372). Then, context and practices can be understood as happening constantly along one another with different speeds and rhythms of change and shaping each other. In other words, as Sampsa Hyysalo describes it: “An event is seen as simultaneously constituting and being constituted by broader patterns” (Hyysalo, 2010, p. 51).

A biography of artefacts approach may relieve some of these tensions, though by no means all of them, by exploring the notion of context through two important moves. First, by extending the temporal dimension of the research it relativizes contexts and analyses how different actors experience them and constitute them. Second, it takes contexts as being simultaneously shaped with the phenomena in focus, and characterizing the difference between them not as one of necessary causal relations

but one of focus, of concentrated attention in certain trajectories, assemblages and actors, while no in others. It is many times a matter of complexity reduction rather than absolute observation. In this sense, contexts become part of the analysis itself and can be understood as contingent both in their trajectories and in the way different actors perceive them and mobilize them. This approach resonates with that of STS scholars with an interest and sensitivity regarding history, particularly Kristin Asdal's work around contexts in action (Asdal, 2012).

As researchers, we also need to acknowledge the contexts to which we appeal as partial observations of an almost infinitely complex reality, which is shifting and unravelling simultaneously through multiple timeframes. Moreover, the BOAP approach provides a good opportunity to connect STS with disciplines and authors that have a stronger experience in working with time both theoretically, aspects that I have discussed in detail in my theoretical chapter, and methodologically. In this line, there is another valuable sense in which scholars have argued we should not understand contexts only as external permanent conditions shaping the phenomena from the outside, but as already constructed observations relevant to an actor or a system.

This is so because actors interiorize contexts, interpret, mobilize and readjust in reference to them in the course of daily living, both shaping contexts and being shaped by them. Contexts are precisely already constructed partial visions or observations, in the sense of the German sociologist Niklas Luhmann (Foerster, 1988; Luhmann, 2000, 2006). That is, observations through which a system or an actor makes sense in terms of its own organization of dynamics happening in the environment that encompass them. This relation is not one of determination, but one of structural coupling and co-evolution. A context implies both spatial and temporal delimitation, and limits in terms of significance, of attention: how can limits be drawn in the almost infinite complexity of the world in a sense through which their influence on the system does not become immediately destructive, becomes intelligible and more importantly, becomes actionable upon. As Kristin Asdal puts it: "contexts

should not be seen as something external, but rather integral to the relevant text and situation, thus the very issue at stake.” (K. Asdal, 2012, p. 380).

By drawing on Humberto Maturana’s and Francisco Varela’s work (Maturana & Varela, 1987; Maturana & Varela, 1980), and Varela’s later work on the neurophenomenology (Thompson, 2004; Varela, Thompson, & Rosch, 1991; Varela, Vermersch, & Depraz, 2003), we could say that just as “everything said is said by someone” (Maturana & Varela, 1992, p. 26), everything observed is observed by a particular observer. Thus, any context constituted by situated and partial observations-understandings is already an ongoing, historical and constructed observation of a, in principle indeterminable, dynamic and complex environment. In this sense, contexts are not summoned directly from the “outside” as objective representations from an “outer reality”. They are not simple pictures of external forces, rather they are the invocation itself: ongoing partial observations, often stabilized to be used as resources, which trigger and allow decision making, sense-making and agency. In short, contexts are more a practice of weaving together⁹ multiple elements from an immensely complex constellation, rather than detached forces shaping unidirectionally the phenomena at play.

Through this thesis, I aim to understand and develop the notion of contexts through this perspective: as being embodied, only partially observed, relational, and developing simultaneously as the phenomena studied in focus. I try to grasp this movement across the thesis through the notion of *contexting*, which aims to track the constitution of contexts as a practice and the associated use of those contexts both as explanatory forces and as justification for action in the present. This notion will be especially exemplified and used in Chapters 3, when I explore how Correa’s own understanding of Ecuador’s pasts and futures would be stabilized into contexts that would justify political, economic and social measures, among them Yachay.

⁹ In fact, according to its etymology a context is: “*context (n.) early 15c., “a composition, a chronicle, the entire text of a writing,” from Latin contextus “a joining together,” originally past participle of contexere “to weave together,” from assimilated form of com “with, together” (see con-) + texere “to weave, to make” (from PIE root *teks- “to weave,” also “to fabricate”).*” (Source <https://www.etymonline.com/word/context>, last visited 13-02-2020)

Nonetheless, as I describe in Chapter 6, when the turn in government changed this stability also changed and Correa's mobilized contexts were severely put into question by Ecuador's new president Lenin Moreno and a wave of new actors that entered the project reconfiguring it.

Both temporalities and contexts will be understood as actor's categories, contingent and partial invocations conducted by actors that may align or compete with each other, that can also appear as emergent properties in assemblages such as Yachay observed as a sociotechnical project constituted by the interrelations of multiple actors, infrastructures and their temporalities. Contexts and temporalities then are connected to the aforementioned "viewpoints" (Kaniadakis, 2012) and can be studied as resources actors invoke and delimit to act, intervene, make sense of and position themselves within complex dynamic settings. The actor's contingent positioning within the project and in other setting such as the government shapes these elements as actors remain attentive to their shifting opportunities, unexpected events and to the relational infrastructures they are both shaping and embedded in. In the words of Elena Esposito:

...we look for a sharper problematization of the idea of environment—not as a "given," to which an organism or system must adapt, but as a multifaceted and flexible reference, which changes with the way it is observed and with this perspective of the observer. In this sense, the environment is not an assumption, it is a problem. It is not the environment in itself (a notion which doesn't make much sense), but the environment of someone or something. (Esposito, 2017a, p. 283)

Additionally, actors constitute each other's surroundings, they are oriented towards each other (B. Barnes, 2001) and according to configurations related to hierarchies or distributions of power, actors may be observed and experienced as strongly determining or malleable backgrounds that can or cannot be negotiated with. For

instance, the case of ex-president Rafael Correa Delgado that I mentioned earlier in the chapter. Then, if contexts cannot be presumed as objective representations of external forces but more as contingent ways of weaving together specific observations and understandings of multiple elements of an immensely complex environment, then we need to pay attention to how these partial accounts are turned into collective referents for action. Chapter's 3 and 6 will pay close attention to how these activities were connected to the infrastructuring practices in Yachay.

Having positioned my research within the framework of the BOAP approach and described my approach to contexting, now the following sections of this chapter describe my data collection stages and the methods I have used to conduct this investigation.

2.2. Data collection stages and methods

2.2.1. The two stages of my fieldwork, general impressions and difficulties

My data collection consisted of two interconnected stages of empirical research. In the first stage, conducted between December 2016 and April 2017, I developed a pilot study aimed to map and contact the most relevant actors, locate significant documents and sources, and make observations and interviews. This first stage would test my theoretical and methodological approach. The second stage, conducted between September 2017 and May 2018, involved re-establishing contact with relevant actors, establishing new connections with new actors and developing adjusted interviews and observations across a variety of settings in Quito, Urcuquí and Yachay. Additionally, during that time I also conducted archival work at the National History Archive in Quito and at Ibarra's Municipal Archive. I did not intended to achieve saturation with respect to my interviews; rather I wanted to trace how conditions and understandings had changed across these different moments.

During these two periods of data collection, I used the following methods: non-participant observation, semi-structured interviews, oral life histories and document analysis. Throughout this time I was able to conduct 85 interviews with a wide diversity of actors, who I are introduced in the next chapters, observe the dynamics of both Yachay EP and YachayTech during different periods of the project and identify the temporal dynamics in action across practices, personal trajectories and institutional histories. I triangulated my observations with the interviews and the documents in order to achieve an integrated and robust understanding of the dynamics of the project across time.

During my pilot study, I was able to make 30 interviews with a variety of actors aged 18-105 in different settings within the sites of the project in Quito and Urcuquí (Yachay EP's offices and meeting spaces, YachayTech University, Yachay's plaza, the techno park, among other places.). I had four main goals for my pilot study: the first was to gain a deeper understanding of the actors involved in the development of Yachay in order to situate strategic gatekeepers and influential actors that had been involved with the project in the present, or in an earlier stage, that could enrich my investigation and provide in-depth insights. The second was testing my theoretical and methodological approach to see if it was fit for the specific case and to gain sufficient understanding of the limitations and strengths of the methods I used for the data collection. The third goal, was to test the reliability of the contacts I had developed in the previous months in the institution via emails and telephone, explore their connections and see if the kind of information I have planned to gather was attainable or not in that stage of the project. The fourth goal was to make new strategic contacts within the different settings of Yachay and to start constructing a relationship with them that could allow me to enter my next stage of empirical work with a better grasp of the resources and relations at stake.

After the first round of the 2017 presidential elections, I travelled back to Edinburgh. With the help of my supervisors, I revisited my methodology, and readjusted my methods to fit what I had encountered in the field. However, when I returned to Ecuador in September 2017, the scenario had drastically changed. Lenin Moreno the

new president had unexpectedly turned against Correa (see chapter 6) and the setting in Yachay had changed significantly. A new administration was in place so I had to renegotiate access and restart the process of making contacts and gaining some trust from the new actors. During, my second phase of fieldwork I had the opportunity to delve deeper into YachayTech's actors such as students, lecturers and academic authorities, and along with the new actors of Yachay EP, community leaders and local authorities I was able to conduct 50 interviews. Four other interviews were conducted *vía* Skype with actors in different regions of the world, and for the remaining interview, I travelled to Louvain-the-New in Belgium to meet ex-president Rafael Correa Delgado (see next sections for the importance of this interview in my research).

In order for the reader to get a better grip of my fieldwork I have produced a synthesis of my exploration and the data I was able to collect in a graph presented below. The graph shows the places I visited during my fieldwork, the actors I interviewed with the groups-institutions they belonged to, some of their characteristics like age-nationality-profession, and the methods I used.

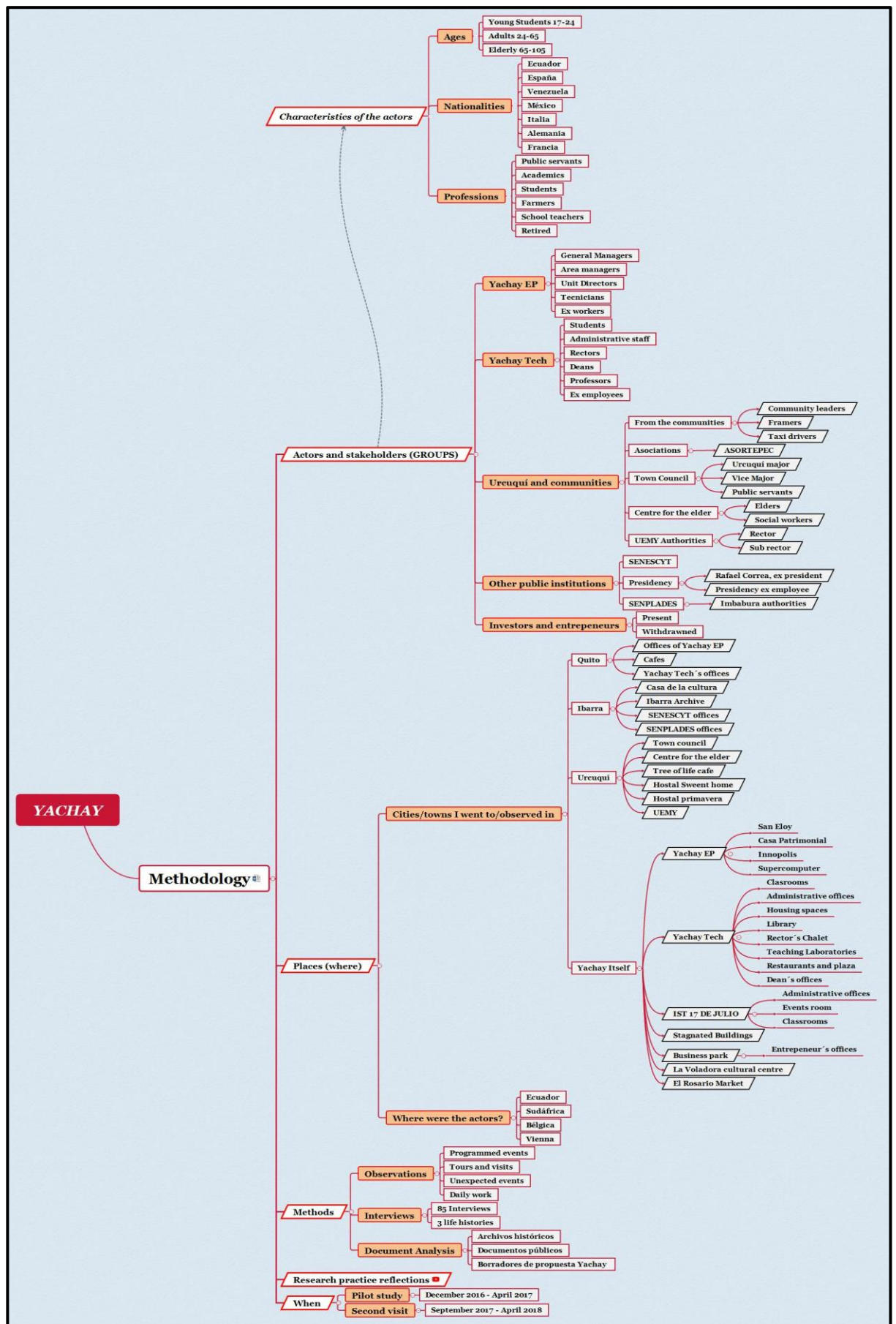


Figure 5. Map of my data collection process.

In respect to the objectives of my research, the two stages targeted two main goals. First, to identify and gain knowledge about the main actors, institutions, practices and narratives that had been key to the infrastructuring of Yachay from the early stages to that moment in the present. Complementarily, I aimed to gain a better understanding of how, when, in what circumstances and moments could I observe and analyse temporal dynamics and the experience of these by different actors¹⁰. Second, to identify the documents and archives where I could find relevant information about the pasts and futures at stake in the different moments of the development of Yachay, which could help me understand the roles of the mobilized futures and pasts in infrastructuring the project. Similarly, I aimed to identify the ways in which actors and institutions within Yachay observed, interpreted, negotiated and acted upon the shifting mobilized contexts at that point in time.

¹⁰ This led me to identify a set of phenomena, which I identified as temporarily significant for my research. Among others these were: planning practices, design and re-design practices, planned public events, tours and guided visits of the city, planned events for Yachay's actors, informal meetings between area managers, public interviews in mass media of which authorities took part, inauguration of new buildings, among others.



Figure 6 A picture I took while entering Yachay by foot, the big sign on the right hand side reads: “Yachay the City of Knowledge. Bienvenidos, Welcome, Alli shamushka.” Thus, welcoming visitors in Spanish, Kichwa and English.

When I arrived in Quito I first visited Yachay EP’s main offices, there I met with the authorities that had to sign the formal approval of my research and was introduced to the person that was going to help me with mediation when needed to get access to interviews or events. I started from there and began making contacts and asking for appointments for interviews. I remained in Quito for a week engaging with the actors and starting to observe the types of work they developed, the documents they used to support and present their work, the activities they took part of and the events that took place in that centre. Some of the actors that I met there were the general manager Hector Rodríguez and his four personal advisors, a number of different area managers, public officials and a group of entrepreneurs who were receiving support for their projects .

The internal organizational structure of the EP was not clear to me, as the information posted on the official web page was outdated and unspecific; resembling a historical document of the previous shapes the organization had taken. Soon, I realized that it has been readjusted constantly since the creation of the EP in 2013 (see chapter 3),

with internal areas being created, disappearing or merging based on administrative decisions several times. Due to these changes, a number of authorities had been in charge of different areas in different periods, so it was usual to find that the same person had experience managing more than one area. Interestingly, the way this works seems to be at times so specific that many of the EP's employees did not know what the organizational structure of the enterprise was at a given moment. They focused on their area and if they needed to get in touch with a different one they make a couple of calls to find out whom to contact for a specific diligence. It was clear that the EP itself was still undergoing a process of institutionalization, and actors were learning on the go.



Figure 7. One of the first views when arriving to Yachay EP's offices in Urcuquí is this sign that orients visitors towards Innopolis, an entrepreneurship centre constructed by the EP to host entrepreneurs and help them develop their projects. In the background there are crops covered by the Andean mist. This was a common site for me and many of the public workers when arriving by foot.

This was one of the first elements that drew my attention about the EP when I met the general manager's principal assessor; she was not clear about the internal structure and the different people in charge of the multiple areas at that precise moment. She asked around and even made a call asking about the topic, but no one she contacted could say certainly if one of the areas still existed or was going through

a process of merging with a different one. Later, I realized I could not rely on the stability of the formal organizational structure available online or on some of the briefing documents because the EP was still being structured 3 years into the project. These documents were also of particular interest, as they constitute valuable historical documents of the transformations and the expectations in terms of internal organization the institution had in the previous years. In this respect, historians of science have highlighted the importance of “opening up the scope” of what counts as a source and what can provide meaningful insights into the past trajectories and dynamics of organizations and sociotechnical projects (Aicardi & García-Sancho, 2016).

Moving along, getting access to YachayTech (the University) was harder than I had expected, especially because there was a marked distancing between the EP and the university. As a result, I had to apply separately for access to each institution even when the approval of the EP was supposedly enough. The strong tension between the EP and the University made it difficult to navigate between the two institutions and actors from each one of them had rather negative opinions from one another. Naming one with an actor of the other could spark certain apprehension.

Regarding sampling techniques, I used a snowball sampling and opportunist sampling methods (Atkinson & Flint, 2001; Noy, 2008). By snowball sampling, I mean that I accessed interviewees through contact information that was given to me by other interviewees or informants with whom I had an informal conversation. After each interview, I would ask my informant two questions: whom would they suggest me to speak next to get a better grip on the development of Yachay, and who had been the person or persons who had influenced their own understandings of Yachay. Often, the responses to the two questions would not match, so I had the opportunity to explore two paths that could guide me to different sources. This proved very useful, as I was able to get in touch with actors who had been very influential but were no longer present in the project, and whom current senior stakeholders might not mention as they had parted ways in difficult terms. This connected me to knowledge networks of the project that sometimes had been already forgotten, because of the

change in area managers and employees, or because of internal conflicts. This was a way in into the notion of relational infrastructures, as some of these conflictive relations would become central to my understanding of the dynamics of the project (see chapter 5).

This is an important aspect of my research that denotes the tensions and struggles I found within the project itself in terms of: visions of Yachay's future and its initial inspiration, the processes of decision-making and the struggle for influence over the project. In this sense, snowball sampling was not only a means to gain access to diverse sources of knowledge about the project, but also, a way in itself of highlighting, activating and making visible connections and relational networks. As Chaim Noy puts it: "Knowledge, then, does not exist solely in an objective form, inside a container. When viewed in this light, sampling procedures in qualitative research are not instrumental means whose sole purpose is to enable access to knowledge. Instead, these procedures entail knowledge in and of itself. Snowball sampling illustrates this argument clearly: it is essentially social because it both uses and activates existing social networks." (Noy, 2008, p. 322).



Figure 8 Pictures I took of the different spaces of YachayTech in which I conducted observations and interviews. The University functions in the repaired buildings of an old Hacienda, I will expand on this topic on the chapter 5.

Additionally, snowball sampling allowed me to get familiarized and explore networks which I did not have access to before and which structure I might have overlooked otherwise, thus making many actors and significant elements “hidden” or hard to reach from the perspective of an outside researcher (Cohen & Arieli, 2011). I complemented the snowball sampling with strategic sampling, which allowed to identify key actors in the history and present of the project that were not mentioned directly by respondents, due to a variety of reasons ranging from hierarchical relations to the absence of daily contact.

This is the case of Ecuador’s Ex-President Rafael Correa Delgado, whom I interviewed in August 2018 in Louvain-la-Neuve, Belgium and who was one of the main actors in shaping and being shaped by the development of Yachay. Even so, almost no actors within Yachay suggested me to interview him, as his position within the government was perceived as out of reach. I was able to contact him by pursuing a complicated trace of interconnected relations, some of them in an unplanned, unexpected and coincidental manner. This momentary opportunity emerged during my observations in YachayTech and during my interviews with three actors there. Correa’s interview is of enormous significance for my research as it allowed me to understand the perspective and actions of one of the actors that was observed by most actors in Yachay as the person setting the pace and objectives of the project. He was also crucial in defining what contexts were relevant at different given points, and embodying a supposed “external” political setting to which other actors had almost no access. The interview allowed me to view that “context” as part of a simultaneous dynamic but with uneven durations and power-relations. I use this interview all across the empirical chapters.

I realized as well that Yachay had been part of a variety of public institutions in its past. Therefore, gaining a better understanding about the significance, the specific actors linked to the project in that moment, and effects of the change between institutions was one of the objectives I wanted to achieve through the interviews and

the informal conversations I had with the informants. Some of the informants referred me to actors that were no longer part of the project but that were highly important in its history. Getting in contact with these actors, some of which were perceived very negatively from within the EP, and interviewing them was one of the most interesting aspects of my fieldwork. Through them, I was able to get access to competing views of the project of its origin and the types of work required in transforming it from an initial plan for a technical university into the ambitious “city of knowledge”. Through them, I also gained access to a set of documents of great interest for my investigation like early demonstrations of the project, even before it was called Yachay, PowerPoint presentations, drawings and thought-provoking accounts of how the project had to gain support internally from a diversity of political actors, groups within the government and the president himself.

In order for the reader to have a brief vision of the project’s history I have synthesized the main events in Yachay’s history in a graph presented below. Even so, the content will become clearer as the narrative progresses across the following chapters.

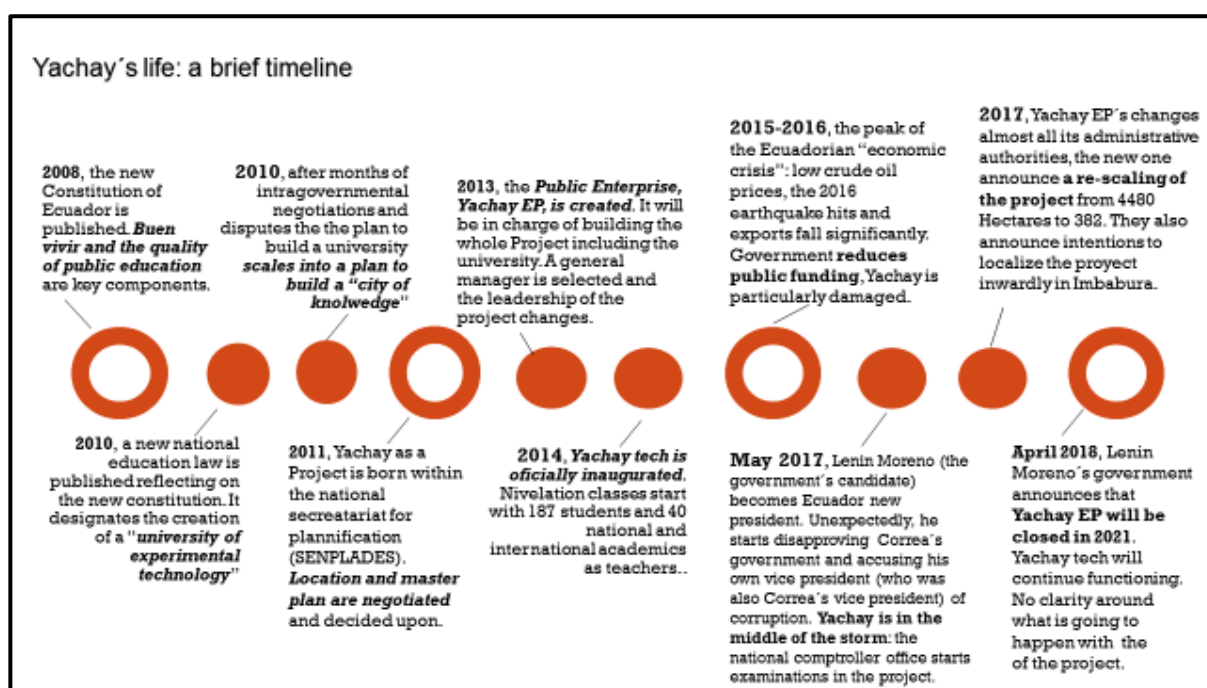


Figure 9 A brief timeline of Yachay’s life until 2018.

2.2.2. How to track temporalities? Interviews, Observations and document analysis

Interviews

Interviews, I want to point out, are temporal phenomena in themselves not only in regard to the duration, but more importantly in how they are temporally differentiated from the rest of our daily lives. An interview is also a way of taking an individual apart from the temporal stream of their own doings and labours, and asking them to reflect upon them, sometimes retrospectively sometimes prospectively into the future. Questions such as, who is allowed to speak, what elements or narratives are repeated, which communicational infrastructures are used during interviews, what kind of topics are hinted at or avoided, can provide very valuable insights into how one might conduct observations afterwards. Interviews in this sense are temporal bubbles created by the researcher, and sustained by both researcher and interviewee to generate a time and space for reflection and temporal estrangement.

All of the interviews, except for specific cases that I will mention explicitly, have been anonymised to avoid my informants being recognized. I have tried to keep enough detail in their descriptions so that their positioning in the project is relevant to what they have to say, but not so much that they can be recognized. The interviews focused on developing two different but complementary accounts of each actor involved. First, an account of how they understood, related and contributed to the present situation of Yachay, the narratives being shaped and how they made sense of their interactions with the long future of Yachay, the current actors involved and the contexts in motion. Second, an account of the longer trajectory that had led them to join Yachay, their previous experiences, and the expectations they had before they joined the project and the reasons they had for joining the project.

One of the issues that have been highlighted concerning traditional ethnographic approaches in STS like ANT is the simplicity with which they tend to address

methodological design. For instance, abstract and generalizable dictums such as “follow the actor” do not provide enough guidance or reflexive accountability in respect to the decisions that need to be taken when social researchers develop empirical research. For example, how to decide what actors to follow, where should one do it and how to follow them are not defined (Sorensen & Levold, 1992). As a social researcher, one should reflect also about the temporal extension of the observation (as highlighted by the strategic ethnography approach); for how long and in what periods should we follow the actors, should we follow them into their pasts too (in respect of the appropriateness of historical research). From my theoretical and methodological standing point, the way in which actors make sense and give account of their past trajectory’s is very relevant for understanding the way they position themselves in the present and how they visualize and imagine the future. Hence, if I want to understand expectations as temporal artefacts that permit the generative interaction between pasts and futures then I need to incorporate a way of tracing that interaction in my way of following the strategic actors, including following their histories into the past, and in the focus of the interviews.

For these reasons, my interviews were divided into 3 sets of questions. I started by asking about the professional and personal trajectory of the respondent, moving on into how they became connected to Yachay for instance asking about how did they get to know about the project and what were the elements of the project that draw them towards it. These questions aimed to trace both their previous trajectory and what they observed in Yachay and the expectations surrounding it that made them interest in the project. This first section was inspired in oral history interviews, and I felt that it became a valuable resource of my interviews as it made the respondents aware that my interest was not only in the project as a whole but also in them as actors in and beyond Yachay.

Then, in the second section, I asked questions about their work in Yachay, about how their work had changed over time, and how they related their work to the development of the project. I also asked about how they perceived Yachay the first time they arrived, what had made them stay and what challenges had they faced

both in their work in Yachay and personally. Finally, the last set of questions, was directed towards prompting respondents to tell me about how they perceived Yachay in the near and mid-term future, how they perceived the future of the past challenges and the impact the project could have in the country, if any. I did not ask every question in every interview; and as my research developed, I tended to define more precisely the questionnaire before the interviews, tailoring it to specific themes or to the specific person I was going to interview. To do this, I often had a small conversation with the person in which I would introduce myself, explain my research and ask a few general informal questions. This also happened through the emails I used to contact some of the academics and students of YachayTech.

One special case among the interviews was the one I conducted with ex/president Rafael Correa in Louvain-la-Neuve, Belgium. This interview was especial for several reasons. To begin with, it took me almost a year and a half to get access to ex-president Correa and schedule our meeting; in fact, up to two days before the interview I had almost surrendered any hope that it would be possible. Even so, I received a confirmation call and I travelled to Belgium the next day (the fact that I am Ecuadorean made this process more difficult as I had to apply for a visa just in case the interview was granted, and the visa arrived the day before I had to travel). Secondly, this interview was an important piece for the picture I was trying to portray of Yachay: I wanted to trace not only the projects life but also how different actor's trajectories were coupled to that process and had been reconfigured too across time. Also, and connected to the BOAP approach I was using, I wanted to be able to track the different perspectives of the project and the mobilized contexts embedded in the specific positionalities of actor's within the those arenas. In other words, being able to interview Correa allowed me to gain a better understanding of his own positionality on the project, and explore how his own perspective differed from that which other actor's had of him as Ecuador's president. This was the case because during his time in office Correa was perceived by most actors in Yachay as an external actor that nonetheless had enormous influence on what happened internally in the project.

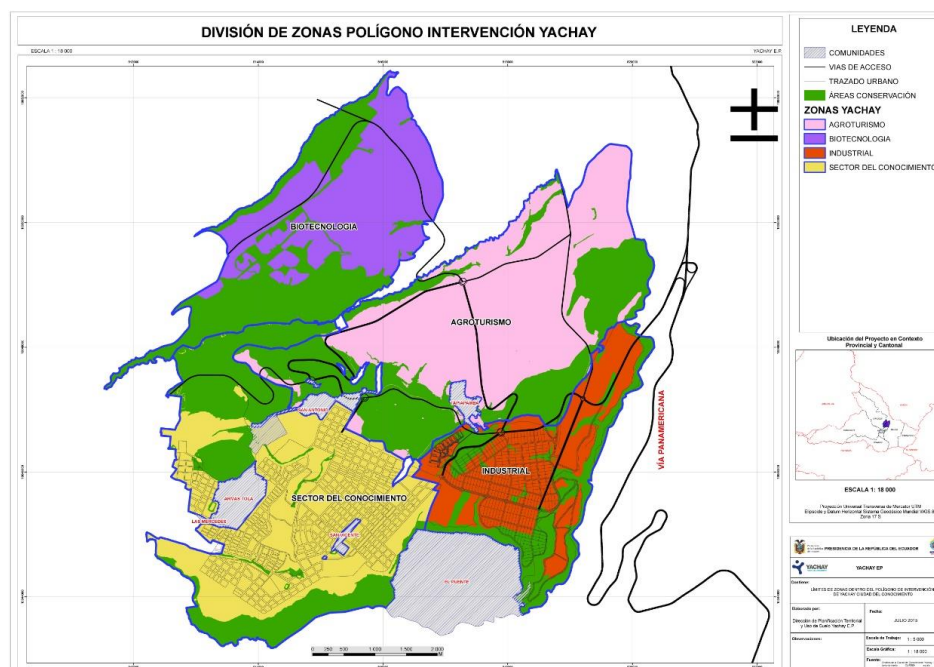
The historical character of the interviews was informed by the long tradition of oral history interviews that have developed a rich and complex account of working with people in the narration of life-courses and significant events. Oral history is particularly interesting for my research because the current emphasis in the field is not only on the subjective reconstruction of historical themes but also, and more importantly, on the process of remembering itself and the complex relationships between the past and the present encountered in the practice and configuration of individual and collective memories (Thomson, 2007). Current investigations in oral history point to understand how the processes of remembrance are tightly coupled with the emergence of a meaningful present shaped both by the existing contexts in which the subject is actively embedded and the way in which she situates towards possible futures. In the words of oral historian Elizabeth Tonkin, “Oral accounts of past events are also guides to the future” (Tonkin, 1995).

Based on these premises, I decided to make three oral life histories from three different actors, which I considered fundamental to the development of the project, in order to understand how and from where and when they had incorporated elements that became central to the imagining, design and developments of Yachay’s components. My aim was to investigate when and from where they incorporated their own temporality into the biography of Yachay as a project, and by comparing this to other sources understanding how this intersection of temporalities shaped both the actor’s trajectory and the trajectory of Yachay. Due to the sensitivity of the political issues surrounding Yachay, only one of these 3 oral history-inspired is used across the thesis with the real name of the actor. The other two have been anonymized to protect the actors.

Then, the interviews were focused on locating the configurational moves actors had realized to get to Yachay and how they have become part of the project’s larger arena positioning themselves both in respect to their individual trajectories, the constitution of their professional space and expectations through the interaction with other actors involved, and the development of the project as a whole. Interviews that are informed by the specific characteristics associated to the oral history

tradition, such as its oral character, the focus on narrative as main form, the intention to highlight subjective historical experience, the particular credibility of memory, and the complex relationship among the interviewers and interviewees can all help to gain a deeper and richer account of social processes when reflexively used and complemented by other sources of data such as document analysis and observation. Hence, combining oral history with a sociological approach to interviews enriches them, deepens paths for interpretation and if performed successfully constructs rapport between the researcher and the informant all of which are desirable and useful for a research that extends across time and tries to capture dynamism and stability over a longer period of time. In short, oral history allows us to understand “how people make sense of their past, how they connect individual experience and its social context, how the past becomes part of the present, and how people use it to interpret their lives and the world around them” (Frisch, 1990, p. 55).

There are at least two reasons why this can be considered important for my research. First, the cultural background and the more profound and intricate history of a collective, a nationality or a community have been studied as being vital for understanding the shaping of agency within the setting for example of nationalistic discourses and practices (Verkaaik, 2010). Second, how collectives judge plausibility around narratives and position in respect to them is strongly shaped by their cultural values and cultural narratives embedded in social practices (Eidinow & Ramirez, 2016; Milojević & Inayatullah, 2015). Furthermore, historians of science have pointed out the importance of triangulating sources and understanding oral history as complementary to documental historical evidence, both formally and as a critical resource, rather than as a replacement for it (García-Sancho, 2016) .



This map portrays Yachay's whole intervention area divided into 4 zones: Agro tourism (pink), Biotechnology (purple), Industry (red) and the Knowledge sector (yellow). (Source: Gabriela Yachay - https://commons.wikimedia.org/wiki/File:Mapa_Yachay.jpg#filelinks, Attribution-ShareAlike 4.0 International (CC BY-SA 4.0))

Observation

What people do might not fit with what they think, and this has consequences, profoundly discussed in the social sciences, around the care one must have in order to be able to use interviews as evidence. However, this is not a one-way street: what people think may not fit with what they do, and this does not invalidate either of them. In an important way, interviews are complemented by observations. I wanted to understand not only what people say they do or how they make sense of that but also what they do, how they do it and how they organize themselves around doing it in coordination with others. It is very important for my research to be able to point out the particular ways in which actors make sense and narrate the ways in which they understand the unravelling of the project and of their own agency in that motion.

In a sense, I am looking at how people experience time, how this shapes their understanding of themselves and their interactions with others, be it other actors, contexts or non-human elements. The temporal flow of practices be it in daily

routines or in unexpected events can be complemented by the temporal estrangement of interviews, which can provide focus on particular actors in an assemblage. Looking at how people make sense, even of their own actions, can open doors to understanding what aspects of social reality they are paying more attention to, which have influenced them the most and which remain unobserved.

My observations were conducted in a range of different settings such as Yachay EPs offices in both Quito and in the site of Yachay (see figure below). The EP had a range of different Directions devoted to specialized activities like the infrastructures direction, the community relations direction, the Planning direction, the City Management direction, the Communications direction among others. I would often visit different spaces in the EP's offices and observe the work that was been done or I would have an informal chat with the public officials. This allowed to get to know their job better and also to grasp a sense of which were the relevant temporalities for them, how their activities were organized how these activities connected them to other actors in Yachay and beyond, and how their practices were organized and distributed across time. During my second stage of fieldwork I observed the increased pace and pressure public officials had to face in the light of the measures Lenin Moreno's government implemented in Yachay and beyond. In YachayTech, I also navigated different settings from the outsides of the student residencies, the general administration offices divided into different areas like the rector's office and the communications team, the classrooms, the library and the offices of different lecturers and public officials I interviewed. From YachayTech you can see the business park and the research clusters in the makings that view became a normal daily landscape for students and lecturers.



Figure 10 Pictures I took of some of the spaces of Yachay EP where I conducted my research. In this case, these are areas of the offices of Yachay EP in the valley of Urcuquí.

Additionally, I also conducted observations of the transit between these spaces. This happened because many of the public officials who worked in the Urcuquí offices of Yachay EP still lived in Quito and had to move back and forth between both to conduct their work. The bus ride took around three and a half hours for each leg; it left the EP's offices in Quito around 6am and arrived to Urcuquí at 9-9:30am. The return leg departed from Yachay at 5:30pm and arrived to Quito around 9pm. Chapter 5 describes these trips in more detail in connection with the infrastructuring process of Yachay and the temporalities at play. I transited this route with the public officials at least 20 times during my first phase of fieldwork.

Another transit was the one between YachayTech and Yachay EP some students, public officials and myself had to do. This was the case because YachayTech and Yachay EP are both within Yachay's intervention perimeter but they are not located adjacent to each other. You can walk between one and the other in around 30 minutes or by car in 5 minutes. These walks were very interesting for me as I was able to observe many spaces in Yachay, like the life in the communities of people who had settled there far before the project arrived, who had small businesses like grocery

shops, and restaurants along with agricultural plots (see chapter 4). Furthermore, in the transit I could also observe spaces in the making like a large public Health Centre that would become part of Yachay in the future or big signs announcing the postponed construction of other buildings. These views were infused with uncertainty regarding whether these buildings would ever be finished or if the space would maintain this look of unfinished and starting to decay. In chapter 4, I describe some of the trajectories involved in Yachay generating these landscapes. During my visits, I also had informal conversation with many cab drivers who are one of the principal mediums of mobilization for the peoples of Urcuquí, and the students, lecturers and authorities of YachayTech. People from Urcuquí knew the region like no other actor as they had to navigate it thoroughly in the past, when the Haciendas were still present. They had a particularly interesting viewpoint of how the space had changed over time, and how the relations between people had been transformed with the arrival of Yachay. When I rode with them, they would tell me stories about life there before the project and signal important sites on the way, name the previous proprietors of the land and show me the limits of Yachay's perimeter of intervention.

These observations were registered in a notebook I kept during both stages of fieldwork and the entries ranged from very empirical descriptions of the settings to reflections that came to my mind moments after I had a particular conversation, something caught my attention or took part in one of the events happening in Yachay. I have included some of these notes across the different chapters especially in chapter 5 and 6, which helped me to connect the different scopes of the research, the "birds eye view" with the "frog's eye view". In line with this, my observations were conducted across time so I could see how the practices changed, how the spaces were being used or not, what areas connected to other areas in daily work, which employees left the project or which new ones came in, changes in the way the sub areas reported and communicated with the general manager when the administration changed in 2017 (see chapter 6), among other aspects.

My intention was also to observe and converse with actors about their experiences of time, how they related to them, shaped them and connected their present experiences to their own pasts. In short, I tried to observe temporally not only across time but experiences of particular and uneven temporalities too. These observations gave me a general feeling of the project's dynamics in practice that would be difficult to capture through interviews or document analysis only. The observations were complementary but they also problematized my interpretation of interviews and documents, the other way around was true too.

Document Analysis

My document analysis was facilitated by the official support of Yachay EP. Nonetheless, I was not granted access to internal documents such as minutes and draft notes, mainly because during my second stage of fieldwork the whole project was under a very strong legal scrutiny by the National Comptroller Agency. This made it particularly difficult and sensitive to gain access to those documents. However, I did get access to a variety of internal documentation and reports. Additionally, I drew upon, mediated by strong reflexivity¹¹, the general reports of the National Comptroller agency regarding their investigations in Yachay. These reports contain quotes from many documents I did not have access to, and more importantly they tackle key issues such as decision making, planning, stagnation and the internal organization of Yachay EP itself.

During my pilot study, I secured access to relevant databases and documents ranging from Yachay's Master Plan, institutional communications, press reports, Yachay's community intervention plans, and visualizations from different stages in the project

¹¹ Because I saw it as a source of valuable data, but one strongly shaped by a particular set of goals and outcomes – that I did not want to be performed by. In this case, this was the political dispute between Correa's government and Moreno's government, in which Yachay became a battlefield (see chapter 6).

and official statements to the nation. Additionally, I began my archival research within Ecuador's historical archives, beginning with Ecuador's National Archive and the National Assembly Archive. Also, I contacted and interviewed actors in Urcuquí who had important documents regarding the history of that region that were not present at the Council as Urcuquí does not have a library or an archive. I understand that these documents not only represent specific descriptions of what the institution has done or wants to achieve, they are ways in which the institution communicates with itself and represents itself, and how it functions, under specific circumstances which are not neutral but tied to political interests and beliefs (Freeman, 2006). It is relevant not only when a document was written or what its content is, but how it is used, interpreted, applied or ignored over time. I have tried to analyse how documents interact with practices, how they are shaped by practices, and how documents shape practices too (Freeman & Maybin, 2011).

This is of particular importance in a setting of governmental organization, where documenting, evaluating and reporting are fundamental tasks in everyday work. And more importantly, documents are a key component in the way that public officials portray advances, how they communicate the consecution or disillusionment of expectations, how the evaluation of progress and the certification of commitments are achieved. For example, across the thesis I will be offering and analysing images from Yachay that I found in a variety of documents and settings. I will try to explain who designed the images, who were the intended audiences and what purposes they pursued through them in the specific time they were created and socialised. These images had a variety of audiences ranging from specific political authorities during meetings or presentations, to the general public in an anonymous way. Accordingly, their objectives and uses changed as well. I consider that these images, often time in the form of visualisations, are interesting resources to analyse expectations, as they are understood in this thesis. In a way, through these images we can observe pasts and futures simultaneously, at least how they were observed and mobilised at the given time. For example, chapter 4 will present visualisations employed during the selection of the site for Yachay and the material reconfiguration that would be

deployed onto the existent infrastructures and terrains. Below you can see two of these images, showing the materialization of Yachay's futures materializing in the valley of Urcuquí both seen from a bird's eyes view and in the form of specific buildings.



Figure 11. In this 2012 image, a vision of Yachay in the future with the landscape of the Valley of Urcuquí. (C. del C. Yachay, 2012b).

I encountered the images of the repair of the Hacienda buildings in which YachayTech would eventually function, in at least three different spaces: first in the offices of Yachay EP where they were publicly displayed as a sign of the work conducted by the EP and of the symbolic reconfiguration of the spaces. Second, in the administrative offices of YachayTech itself where they were displayed as a symbol of the historical importance and long duration that those buildings had in the past, and finally in the website of YachayTech where it is used to tell the story of the University and present to the visitors the especial site where the University is located.



Figure 12. In this image of 2012, we see the ruined Hacienda workers' houses merged with the future students' accommodation. (SENESCYT-Yachay Ciudad, 2012, p. 21)

2.2.3. Limitations of my research

According to the BOAP, we must be honest about the methodological decisions we make and about the implications of those decisions in what we can and cannot observe and know during our research. In this sense, I will now explain some of the limitations of my study. First, it is limited by its temporal duration and should be understood as a moment within an ongoing investigation. In this sense, in no way does it claim to represent the entire complexity of the project or the vision of all of those who have participated or have been affected by it. The thesis itself is one narrative among the many possible that could arise from the data I have collected, and the data I have collected is in itself limited. For example, I was not able to interview some key actors in the process of shaping Yachay, among them the Korean team of IFEZ who will become relevant starting in chapter 3, and members of YachayTech Board of Trustees who will come into the scene in Chapter 5. I have no doubt that their contribution to the project was significant and that any future research should incorporate their accounts. I was not able to do so mainly because I

could not enrol them in the research, even when I tried multiple times and through various means.

Similarly, I have chosen to focus on temporality but there are many other relevant aspects of the project that I have not analysed. One of these aspects is the international circulation of similar models across the globe. In this sense, Ecuador itself is not a solid boundary to the type of dynamics involved in the constitution of Yachay or the networks that I describe in the thesis; these dynamics are interwoven regionally and globally. However, these local, regional and global dynamics constitute each other simultaneously; hence, global dynamics are not just a passive context of what happens outside of Ecuador that only resonates in the country. For these reasons, one of the limitations of my study is the single-sitedness that comes by choosing Yachay as my only site of analysis. By setting the onus of the analysis on the local, I am aware that I am underscoring the international and even global aspect of these type of projects. Even so, I have tried to incorporate these international dimension through the history itself of Yachay and especially through the actors linked to the project. This was the case with Correa and Louvain-the-New, as well as with key actors who mediated the Korean influence over Yachay's model.

In this line, historically-inspired research can be complementary to a strategic ethnographic approach and can help pumping time into the planeness of more traditional ethnographic approaches that Williams and Pollock have called "flat ethnographies" (Williams & Pollock, 2009). Even so, historical analysis could help me to mitigate some of the limitations coming from that kind of analysis that focuses only on the local, by allowing me follow the history of Yachay to the sources and sites from which Yachay's planners have taken inspiration or have directly tried to mimic. This may be understood under the figure of "connected histories" (Subrahmanyam, 1997) and the circulation of imaginaries and ideas across different settings, even within the same region of the world, rather than portraying Yachay as a mere echo of global dynamics as other authors have tried to do (Chavez & Gaybor, 2018; Fernández González, Cadenas, & Purcell, 2018).

2.3. Chapter Conclusions

In this chapter, I have focused on describing the strategy I followed for this investigation by defining my research design and narrating how I have applied it during two phases of empirical research. I started by describing my general approach for this investigation inspired in the BOAP approach, I highlighted the reflexive longitudinal aspect of BOAP and how I have used it to approach my study of Yachay across time and focused on temporalities. Then I reflected on STS's approach to studying time, briefly centring on my positioning in the debate around contexts. I presented the notion of *contexting* based on Kristin Asdal's work (Kristin Asdal, 2012b) and on the methodological considerations of the BOAP authors (Hyysalo et al., 2018; Pollock & Williams, 2010a; Williams & Pollock, 2009). Contexting was introduced as a way to capture the practical side of contexts, their weaving together and their mobilization as collective resources. Later, I discussed my stages of data collection and how I deployed my chosen methods by informing the reader about how I gained access to the project, and explaining the decisions I took on the way to face the emerging challenges. To finish, the limitations of this study were presented and discussed.

The next chapter is the first empirical chapter; it starts the account of Yachay's life by describing the historical trajectories coming together in Rafael Correa's government with special focus on the temporal politics entwined in the governmental actions and the contexts mobilized to scaffold them. The onus is on describing how a series of transformations in legal and policy spheres, in line with the contexting practices, ended up setting the stage and acting as foundations for Yachay's emergence within the government. Moreover, the chapter tracks how Yachay's initial proposed figure as a Technical Research University was supported by the mobilization of expectations, and how when the project was scaled up into a City of Knowledge expectations played a key role too.

CHAPTER 3. Correa's government and Yachay's emergence

3.1. Introduction: First point of entrance: scaling up, connecting infrastructures and futures in practice

In this chapter, I will describe how Yachay emerged from a process of transformation within the Ecuadorian state, supported in a variety of legal and institutional infrastructures that were put in place during Rafael Correa's administration to reconfigure what was already there. In addition, I will describe how expectations understood as interfaces between pasts and futures, were used to build new commitments, institutionalize the project, gain political support and mobilize resources within the government. Previous academic accounts on Yachay (Chavez & Gaybor, 2018; Fernández González et al., 2018) have located the origin of the project in 2013 when the Public Enterprise (Yachay EP) was created to build the planned city of knowledge. Here I aim to extend that narrative. First, by connecting Yachay story to the past to both Rafael Correa's wider government, and to how Correa's government was connected and shaping Ecuador's longer duration political dynamics. I argue that in order to understand Yachay we need to enter into the deeper temporalities of Correa's election and Ecuador's political history. This section analyses the temporal politics at play, these are understood as the politics involved in the framing, understanding, experiencing to the practices of time telling, time framing and time management in specific settings (Rufer, 2010; Sharma, 2008). Second, by making visible the role other less known actors had in shaping Yachay early on, this problematizes the internal unity of the government and add some contingency to the narrative of previous accounts of Yachay centred mostly in Correa and his close allies. Third, proposing a broader narrative and framing Yachay as an infrastructure that can be studied across time, enables me to analyse the convergence of expectations,

contexts, relational infrastructures in Yachay over time. A topic that will be explored in later chapters.

Most people in Ecuador associate Yachay with Rafael Correa, and this by no means is an unexpected association as the government continuously personalized the project around the figure of Rafael Correa. However, this public perception obscured part of Yachay's history. Particularly the roles of the other actors involved in the creation and design of the project; i.e., the other trajectories at play. In this chapter, I highlight some of those other trajectories and combine them with Correa's role in the emergence of Yachay to generate a richer picture of the project's creation. The historical elements that I describe below serve not only to give background to the emergence of the Yachay project but also to give flesh to the elements that have been mobilized by different actors, stabilized in the form of contexts for example, and that are co-constituted hand in hand with the project, but with different durations. Accordingly, this chapter has three sections. The first one describes some key aspects of Ecuador's political history which have shaped Correa's government, and that are relevant to understand how Yachay unravelled across time. The second section, connects this narrative with the emergence of Yachay within Correa's government putting particular emphasis into the connections of Yachay with the implementation of previous policy transformations, and it describes the scaling-up process of the project from a Technical Research University to a City of Knowledge. The last section, provides the chapter's conclusions and sets the scene for the next chapter.

3.2. Structural instability, temporal politics and an extended present

3.2.1. The historical dimensions of Ecuador's economic and political spheres leading to Correa's government

The economic and political elements that I describe now aim to give the reader an idea of the longer duration dynamics of Ecuador's economic and political sphere, with the focus being those that became significant during Correa's administration and

across Yachay's life. Additionally, I introduce these historical dimensions to highlight the historical depth of the elements under discussion when we talk about Sumak Kawsay¹² (good-living, well living) and the historical debt in Ecuador (Paz y Miño, 2004, 2007), elements which were presented in the introduction of the thesis.

A first relevant dimension is Ecuador's economic sphere. The Ecuadorian economy has historically been marked by cyclical dependence on certain primary export products, a relatively dynamic domestic trade sector and low economic diversification at the national level¹³. Ecuador's economy and incorporation into the world economy during the 19th and 20th century has been characterized for being cyclically dependent on the production and exportation of specific raw commodities such as cocoa, banana and currently oil. This specialization can be traced back Colonial times when the elites established their dominance mostly based on ownership of the land ¹⁴(Chiriboga, 1980; Crawford de Roberts, 1980; for the actuality see Macaroff, 2018).

Furthermore, nowadays, private groups linked to the agribusiness sector, to the intermediation and commercialization of produces and the banking sector are the ones that dominate the national economy. It seems that the emergence of these conglomerates in the private sector which have influenced strongly the national policy since then takes place from the 1960s (Daza, 2018; Anahi Macaroff, 2018a;

¹² Sumak kawsay has been discussed and disputed from several points of view ranging from declaring it a new political system (Ramírez, 2012); as a contribution of the Andean cultures towards the formation of a new Latin American civilizatory model (Macas, 2010); as a cultural appropriation and misrepresentation of indigenous knowledge on the part of the Ecuadorian state; as a token of decolonial struggle and advancement in Latin America (see chapter 3 Mignolo & Walsh, 2018; Walsh, 2010); and as a possible guiding episteme for free knowledge and software sharing. To see a synthesis of the varied tensions and framings see (Hidalgo-capitán & Cubillo-guevara, 2017). Yachay can be interpreted as the most ambitious application of this paradigm to a new project with all the problems and potentialities that brings forth. It would be necessary to trace if it is an appropriation or rather also the result of centuries of struggle and political activity of the indigenous communities of Ecuador and beyond.

¹³ According to the Atlas of economic complexity Ecuador is in the 111th position among 133 countries in the Economic Complexity Index (ECI) despite having the 67th richest economy per capita out of 133 studied in the index, being prominent aspects its low diversification of exports and its dependency on commodities, particularly petroleum oils-crude and banana. (<http://atlas.cid.harvard.edu/countries/67> last accessed 10-12-2019)

¹⁴ Chapter 4 will develop this dimension further in relation to Yachay's implementation in Urququí.

Oxfam, 2016; Vanoni & Rodriguez, 2017). Concerning the banking elite, during 1999, Ecuador suffered one of the events that would most mark its history: an almost complete bank system breakdown, generalized inflation (up to 96% in 2000) and an economic debacle that would result in the dollarization of the national economy during the government by Jamil Mahuad (1998-2000). The break was generated by the practices of the national private banking system and the central bank of Ecuador, the approval of certain laws of previous governments and of the same government of Mahuad. During it, the government gave a bank bailout of 1600 million dollars to private banking, froze the deposits of thousands of users and generated a total loss of 8,600 million according to the central bank of Ecuador. This unleashed a massive migration of the Ecuadorian population abroad (Ramirez & Ramirez, 2005). In 2007 when Correa term started, the economy and the society were barely recovering from this event.

Regarding oil dependency, at present Petroecuador, the state company dedicated to the management of oil resources in the country, far exceeds the private sector in its central role in the national economy. It is the biggest company in the whole nation. In this regards, Ecuador has had 2 moments of oil boom that have shaped the current dependency, the first during 1972 with the inauguration of SOTE (transecuadorian oil pipeline system), and the second during 2003 with the inauguration of the heavy oil pipeline. Until now, Ecuador's economy remains overly-dependant on crude oil extraction and the associated variability of international oil prices. This also implies that the state is the biggest and most influential actor in the country's economy. This dependency was intensified during Correa's administration with the renegotiation of oil contracts with international companies, and the big increase in public investment that followed¹⁵.

¹⁵ During Correa's government, there was an average increase in international oil prices, but production did not increase significantly during the ten years of his government. Social investment grew steadily throughout his government, replacing oil revenues with external debt and domestic public debt at the times of lower international oil prices (2009 y 2015-2016). Among the advances reached during this time are the reduction of poverty, high investment in education and health, reduction of inequality and significant investment in road and energy infrastructures.

Concerning the political dimension, when Rafael Correa Delgado assumed the presidency of Ecuador on January 15, 2007, the country came from decades of intense political instability and social upheaval reflected among other things in having had 12 presidents in a period of 25 years since the return to democracy in 1979. Of those 12 presidents, seven had been in the last 10 years. Of those seven presidents, three of them were overthrown, which meant that since 1996 no president had served a full term in office. In fact, the instability both at the governmental level and at the level of the laws, for instance the validity of the national constitution, has marked the political history of Ecuador throughout the twentieth century¹⁶. Hence, coups d'etat, constant fragmentation-political struggle, the dominance of the economic elites in political life and continuous constitutional reforms have all been salient elements of it (Fitch, 1977, Negretto, 2015, Pachano, 2004, Sánchez-Parga, 1998).

Among other structural effects these elements of instability and political sectarianism restricted long-term planning in terms of national public policy and the continuity of infrastructure projects. This was due, among other factors, to a high politicization and turnover of public servants limiting institutionalization processes and collective learning that is reinforced by high volatility in public investment (Ecuador is the country with the 3rd highest variability in Latin America) (see for instance E. Armendáriz & Contreras, 2016). This by no means is a dynamic restricted to the past.

To get an idea of the contemporary status of these dynamics, the government of Lenin Moreno¹⁷, successor to Rafael Correa, who took office in May 2017, has had already

¹⁶ Take for instance the high political volatility and governmental instability that characterized the whole previous century for Ecuador: *"Between 1925 and 1948 there were 27 governments, of which only three had their origin in direct elections, twelve were granted charge of power, eight dictatorships and four were elected by constituent assemblies. Between 1948 and 1961 the longest period of constitutional stability (only surpassed by the current one) was experienced with the succession of three democratically elected governments. After 1961, the cycle of instability was restored, with a constitutional succession, a military coup (1963), the nomination of an interim president (1966), the formation of a Constituent Assembly, the nomination of another interim president (1967), the election of a president (1968), an auto-coup (1970) and a new military coup (1972)"* (Simón Pachano, 2004, p. 1). Additionally, since independence in 1830 Ecuador has had 20 constitutions, being the 4th country in the world with the largest number of constitutions in its history.

¹⁷ Lenin Moreno was Correa's vice-president during his first term in office, and he occupied a variety of public charges during Correa's second term. He was Alianza País candidate for the 2017 presidential

had 3 vice-presidents. Jorge Glas, the first (who was also vice president of Correa in his second term in office), is in jail after being convicted for a corruption case linked to the Odebrecht scandal, which has involved the political and business sector classes of almost all of South America, and that has been highly controversial in Ecuador. His replacement, María Fernanda Vicuña resigned to the vice presidency some months afterwards after being involved in another corruption scandal and consequently President Lenin Moreno stripped her of her functions. She was replaced with Otto Sonnenholzner, a young entrepreneur, economist by training and linked to the world of the mass media in Ecuador. He is associated with the dominant political classes that dominated the national political sphere before the government of Rafael Correa, he is also the first vice-president of the three mentioned that did not occupy a position during the government of Rafael Correa. Moreno separated from Correa's line of government after winning the elections and started an open conflict with him. This will be detailed in Chapter 6 of this thesis. For now, it is sufficient to know that while Moreno was elected to follow the governmental line of the Correa administration this changed drastically, and Moreno became Correa's biggest critic, triggering a struggle that was still present by early 2020.

It has to be noted that Ecuador's political life has been characterized by a constant direct influence of the country's elites on national public policy (see chapters 2 and 6 in Paz and Miño, 2007, Peralta, 2005, Vanoni & Rodriguez, 2017). These elites have been characterized by resistance to change, their strong regionalism and the inability to carry out transformations that provide a solution to the structural problems faced by the majority of the population at the national level. In economic terms, this has generated enormous inequalities and an incapacity to diversify the economic structure of Ecuador (Báez, Cueva, & Moreano, 1995, Conaghan, 1988, Cueva, 1997). Similarly, short termism and fragmentation have been the marks of government planning in the twentieth century. Periods of greater planning have happened during the 70s and later during the Correa government when SENPLADES (the national secretariat for planning

elections and won by a close margin. Chapter 6 of this thesis narrates Moreno's conflictive relation with Correa and how he reinterpreted Yachay.

and development) was created based on existing organizations and would become the rector of development planning at the national level. Interestingly, these moments have coincided with a growth of the state and with prosperous moments in terms of international oil prices and oil production.

When I interviewed ex-president Correa in 2018, one of my objectives was to understand what were his personal understandings of these complicated historical trajectories I have introduced briefly. I wanted to understand how his particular interpretation of these pasts were related to his government's proposed futures. I also wanted to understand the experience of governing in a setting like that, and try to bring to the fore some of the temporalities at play. For example, this is how Rafael Correa described in our interview the conditions that he found upon reaching the presidency of Ecuador, and this interpretation would shape not only what would be considered needed for the present but also looking into the future:

It was a disaster, a total disorder, a lack of economic policy, a lack of an economic vision. We need to remember that economy is a social science, it studies human society and the goal is human welfare, all the rest are means. Suddenly, in the country they were sacrificing the means for the objectives, focused on the country's risk indicators and worrying what the IMF would say. We were one of the most unequal countries in the region, we had generalized poverty. I found a country without institutionality, all dispersed, with aberrations. For example, we were dying of thirst by the source by keeping savings for the times of lean cows. (Rafael Correa, personal communication, 2018)¹⁸

As can be derived from the quote, from the start Correa positioned the need to change things drastically, even to start some institutional aspects from scratch. Correa won

¹⁸ Rafael Correa Delgado, personal communication through interview, Louvain-la-Neuve, August 2018. All translations from Spanish are mine.

the 2006 presidential elections in the second leg, as member of Alianza País a new political party, defeating Álvaro Noboa. Noboa was a banana tycoon who was the leader of PRIAN (Partido Renovador Institucional Acción Nacional), a party that had relevant political significance between 2002 and 2013. Noboa had been part of Ecuadorian politics at least since the 90s and had been a presidential candidate several times. This is important to notice; Correa became president with little political experience, without being part of one of the traditional parties that presented candidates themselves to the elections and were defeated. In fact, one of Correa's offerings was to confront and abolish the traditional parties (known as "la partidocracia" partyocracy) who had dominated Ecuadorian politics in the last decades. In this sense, Correa's figure was presented as embodying this rupture and a change towards more progressive politics based on socializing wealth and restructuring the political infrastructure of Ecuador starting from the national constitution and the national Congress.

Interestingly, Correa himself before being president had diagnosed, from his perspective, which were the most problematic deficiencies of Latin American politics and what needed to be done. Correa's particular understanding of the past of Ecuador's politics, which becomes clear in the passage below, shaped not only his understanding of what had to be done to overcome those pasts, but also what his role as president, as leader, would be in such a process. In this sense, the potential futures of the proposed transformation were linked with his particular viewpoints about the past and dynamics of Ecuadorian politics. Ecuador's political and socioeconomic trajectories were not abstract elements of an already exceeded past; but, problematic, complex and generative trajectories which Correa and other actors interpreted, experienced and acted upon in specific ways. In fact, Correa even had a particular understanding of what the role of a leader should be in the country in order to achieve a different future. In 2006 before being president, he would describe in this way the biggest shortcomings of Latin American socio-political reality:

...the inability or unwillingness to build true national projects
and a genuine regional integration in function of the

development of our countries, just as the United States did before the free exchange attack of England. In this way, perhaps the biggest crisis in Latin America is exposed: the crisis of leaders and lack of true statesmen. Hopefully, in these times of "free trade", that could be imported. "(Acosta, Correa, Falconí, Jácome, & Ramírez, 2006, p. 25)

In short, the expectations being mobilized about Ecuador's future higher education system that the next sections of this chapter describes portray expectation as both directed to future and to the past. The transformed higher education system promised for the future would be triggered by the Higher Education Reform and the implementation of the new 4 emblematic Universities, was constituted by the interaction of particular visions of both futures and pasts. This is why I argue across the thesis, and especially across this chapter, that expectations act as interfaces between pasts and futures, constantly reconfiguring a dynamic relation between the both. A relation that is not neutral but mediated by personal histories, institutional dynamics and collective understandings of temporalities and change. This is why I think is important to understand Correa's government under the light of the longer trajectories at play, and through the government's own interpretation of these trajectories. One of these is the temporal dimension of politics.

3.2.2. Sustaining an extended present

In this line of thought, Correa was 43 years old when he run for president and his only previous experience within the state was a Ministry of Economy, post he occupied for 106 days during 2005¹⁹. Correa was publicly presented as the young new wave the Ecuadorian politics, which could break open a new future, and at the same time, as an heir of the historical political struggles that characterized Ecuador's popular classes.

¹⁹ Rafael Correa had been the Minister of Economy of the previous government for a short period and most of his professional career had been developed as an academic with positions in Belgium and the United States. Interestingly, and connecting it to the issue of political instability, between 1999 and May 2018 Ecuador has had 26 ministers of Economy.

This can be observed in one of the videos for his 2006 campaign called “dreams”²⁰ in which images of traditionally excluded populations such as afroecuadoreans and indigenous Andean peoples are mixed with images of Correa in public speeches and a song which states “I want Correa as Ecuador’s president, a different country free as the sea... I want the oil to be for us all and hunger never more... This time the people comes to govern. Rafael Correa: the homeland above everything”.

This type of collective mobilization of temporal referents, such as the use of the new as a way of organizing social imaginaries and experiences of time, has been analysed by authors interested in the politics of time. These authors have been interested in exploring time not as a homogeneous and abstract component of society, but as an uneven experience of temporalities that is structured by power relations and embedded within specific settings. Huebener argues the point by saying that, ““time” is never a single entity, but is rather a collection of multiple, contested practices and experiences that continuously take shape through the negotiations of culture with nature.” (Huebener, 2018, p. 327). In this sense, Rufer has analysed how specific politics of time supported colonial processes and the historical representation of those processes by establishing hierarchies between societies based on temporal representations, up to the present (Rufer, 2010). Sharma has focused on analysing international hierarchies and structures of time shaped by the specific temporal labour some actors do in order to maintain the temporalities of others. Such as the sensation of speed and synchronization that some actors associate with modern life, but that is sustained by the intensive labour of taxi drivers, for example (Sharma, 2008, 2014). The common thread is the analysis of time as multiple and politically charged, and the political use of temporal framings. I want to argue that these played a fundamental role from the beginning in Alianza País, and that their analysis contributes to a deeper understanding of the emergence of Yachay in the midst of Correa’s government. This resonates with my proposed methodological historical sensitivity, and with my approach to expectations as interfaces between pasts and futures.

²⁰ <https://www.youtube.com/watch?v=ODsBzJOk3hU> (last accessed 17/02/2020)

For instance, the initial slogan of Correa's party during the 2006 elections was "la patria vuelve" (the homeland/motherland comes back) alluding to national symbolism surrounding both the lost pasts of the country in general and Eloy Alfaro as a political figure in particular. Eloy Alfaro may be Ecuador's most famous and admired figure who led the liberal revolution during the early 20th century, cementing a long lasting legacy and, after a brutal death, became a symbol of national identity and political treason. Alfaro was twice president of Ecuador between 1895 and 1911 (1895-1901 and 1906-1911). Eloy Alfaro was present in Correa's discourse from early on, in fact Correa mentioned Eloy Alfaro along with Simón Bolívar in his inauguration speech in 2007 as two paramount references for him and his government:

I will never, never, let down my fellow Ecuadorians; I will consecrate all my efforts with god's help and under the libertarian shadows of Bolívar and Alfaro to fight for my country, for that fair homeland, dignified and sovereign. Which we all dream and we all deserve. ²¹

In fact, in 2007, the government selected Montecristi; the town in the province of Manabí where Eloy Alfaro was born, as the location where the constituent assembly would gather and write the new constitution. A civic centre named Ciudad Alfaro (Alfaro City) was erected in site and president Correa ordered that part of Eloy Alfaro's ashes were transported from Guayaquil to Montecristi before the Constituent Assembly was officially inaugurated. Eloy Alfaro is known as "*El Viejo Luchador*" (the Old Warrior) and his figure embodies a legacy of revolutionary values, representing the struggle and political force of the popular classes, which had traversed Ecuadorian politics during all the 20th century. As can be noted, this weaving together of elements of the past and foregrounding them in the present was a key aspect of how Correa's party aimed to present themselves publicly. This was a way of tapping in into the momentum of the political dynamics of Ecuador at the time:

²¹ Rafael Correa's inauguration speech, 15th of January 2019. Fragments can be found here: <https://www.youtube.com/watch?v=PolVZCLhOPk>. (Last accessed 16-02-2020)

President Rafael Correa, a US-educated economist preaching socialism for the twenty-first century, was elected to office in 2006 on a progressive platform broadly supported by an electorate disillusioned with traditional party politics. Correa criticized the neoliberal policies of prior decades, the political role of entrenched business elites, and US involvement in the region, promising instead to reorient the country toward alternative models of development. Building on momentum fuelled by the work of social movements and the support of the public, including the urban middle classes (Akchurin, 2015, p. 942; Ibarra, Ospina, Guerrero, & Unda, 2008)

In this sense, Correa and Alianza País were interpreting, updating and mobilizing these elements symbolically and materially into the political arena; they declared a rupture with a near past (mainly the 90's or what Correa used to call "the long neoliberal night") but established continuities with deeper pasts such as Eloy Alfaro and Sumak Kawsay. Hence, generating expectations of how the future should look if entangled with these deep pasts. The expectations of a country finally dignified in the future modulated specific pasts, actualizing them, and trying to sow them together in legal and narrative infrastructures that would enable those futures. This will become more apparent in the next section of the chapter, but it is important to point it here.

Importantly, this mobilization of pasts and futures was aimed at generating the sense of a present, a specific shape of the present. One that could not be collapsed into the near past as this represented the rotten *partidocracy* and *the long neoliberal night*, and this present should allow for the partial observation and action upon of particular pasts and futures. This is palpable in the way Correa narrated his experience of the country and the state when he arrived to office:

...(when I got into office) the economy was not in critical conditions, but nothing was done, there was no public investment when it was so necessary. I am speaking at the level of macroeconomic indicators,

at the level of the real economy it was a disaster! There was no health, there was no education, there were no roads, and there was no energy. At the intangible level, the state of mind was in the floor, the banking crisis had not been solved, followed by the Conundrum of the debts without proper accounting. (Correa, 2018)

From my perspective, this narration was a way of positioning a present within the futures and past being mobilized. The past was being portrayed as something that needed to be surpassed, as a long night waiting for the sunrise. Extending that present in terms of reducing the structural instability and extending the sense of a marching process, became one of the governments' central aims. The particularities of that present was that it was being portrayed as an ongoing rupture with a near past, in order to sustain this rupture new infrastructures were designed to extend that present and generated the sense of an emerging future ²². This extended present needed to be incompatible with the near past, as the government presented itself as foundational and revolutionary. This allowed actors from the government to intervene in what their understood to be the status quo in order to generate a new social configuration. Correa put it in these words, exemplifying it with his diagnose of the state of the education and the social expectations when he took office:

There were great social dishonesties, of 5000 English teachers; only 2% passed the English test we applied. So, the families knew that their children did not speak English, the kids knew they did not learn English, the teachers knew they did not speak English and everyone stayed quiet. That was the country we found. The country that was

²² See for example Rafael Correa's inauguration speech on the 15-01-2007: "The Homeland returns and with it, work returns, justice returns, the millions of brothers and sisters expelled from their own land through that national tragedy called migration will return. This hope of a few expanded like fire in the Grasslands and became the hope and decision of all Ecuadorians who wrote a heroic deed in the country on November 26, 2006 and began a new story. Today the homeland belongs to everyone. However, the fight is just beginning. November 26 was not a point of arrival it was a starting point, the citizen revolution has just begun and no one can stop it, as long as we are united and determined to change. The first axis of that citizen revolution was, and is, the constitutional revolution. The citizenship mandate was clear: we want a profound transformation, our ruling classes have failed....!" https://www.youtube.com/watch?v=G122Rf_xdM (last accessed 18/02/2020)

passive in the face of obvious social deceptions, we had to break that inertia. There have to be stronger breakout exercises still. (Correa, 2018)

Nonetheless, sustaining that extended present required work, effort and constant attention to what elements of the present or the future could help to sustain the stability in the midst of a country shaped by political instability as I mentioned before. The structural presence of instability can also be observed as a constant menace in Correa's governing strategies and it is recurrent up to the present in Moreno's government.

Furthermore, this resonance with elements of the past was not gratuitous. Correa's victory in the 2006 elections was supported by a variety of social movements who gathered around him and provided some of the key offerings of his political campaign such as the offer to summon a national constituent assembly. Furthermore, the indigenous political movements in form of both a political party (PACHAKUTIK) and a variety of civil organizations were instrumental in the making of the new constitution and in establishing *buen vivir-sumak kawsay* as one of the ideological axis for the constitution itself and for the national development plan (Becker, 2011; Kauffman & Martin, 2013). In the previous decade, the indigenous movements partially consolidated around the Confederación de Nacionalidades Indígenas del Ecuador (Confederation of Indigenous Nationalities of Ecuador— CONAIE) and led the street mobilizations that ended up overthrowing two governments, providing the political landscape and positioning the need for a political restructuring of the country around which Alianza País would emerge as a contending force (Jameson, 2010; Lalander & Peralta, 2012).

Moving on, once in office, during his 10 years in government, Correa based his political dominance on an unbeatable electoral force which allowed him and Alianza País to win ten elections between 2006 and 2017, in which his party or his government obtained the majority of the vote. These included four presidential elections (including the one that would end up electing Lenin Moreno as his successor and the three that Correa

won in 2006-2009-2013), two sectional elections, one constituent assembly members election, two popular consultations and a referendum. In fact, in his first year in office there were two elections of which he emerged triumphant: the call for a national constituent assembly that would write a new constitution, and the election of the members who would take part in that assembly. In the first one the option supporting the call for a national constituent assembly won with 82% and Correa's party obtained in the second one 80 out of 130 seats in the constituent assembly (Conaghan, 2008).

These victories assured him an overwhelming political domination, for instance one of the first measures of the constitutive assembly was to dismantle the Congress and in that way dissolve any form of opposition from other parties that had won seats for the Congress during the 2006 elections. The stability tied to this domination allowed the government to invest public funds and sustain ambitious resource-intensive state projects through time in a way that previous governments were not able or interested in doing. This particular kind of stability, the extended present I introduced in the previous paragraphs, generated a form of temporality in which long-term promises could be made and made sense. An extended present that embodied the perception of stability and from which the expectations of potentiality could emerge and be maintained.

The government's constant mobilization of temporal references, as noted before, was connected to the pursuit of constructing and communicating the collective sense of this extended present. They wanted to portray a phase in which the country was constantly differentiating from previous times and governments via constant confrontation with them (Lemos, 2014)²³. While also pointing out to the revolutionary character of that present, and in that sense, indicating a claimed exceptionality of Alianza País as political party, the Revolución Ciudadana as political process and Rafael Correa as president. The government was framing a present that had an identifiable initial date or at least cradle, Alianza País winning the presidential elections in 2006,

²³ Take into account for example Correa's reference to the then dominant political parties as "la partidocracia" (the partyocracy or partyarchy). Most of these parties, which had dominated Ecuadorian politics for the previous 5 decades, had to reorganize themselves during Correa's 10-year government, mostly lost political relevance and some of them disappeared.

but that had no clear end as Alianza País intended to extend it as long as possible into the future. This mode of temporal politics can be read through the notion of *temporal framing* proposed by Paul Huebener (Huebener, 2015a) understood as: “the technique of establishing arbitrary conceptual borders around a temporal concept or duration for the purpose of advancing a political agenda.” (Huebener, 2015a, p. 19). Then, this particular way of framing the present was sustained not only by discursive practices but also by a number of elements and resources crossing the economic and political realms.

The stability that characterized that present was both expressed, and sustained through, constant electoral victories, and on the associated expansion and strengthening of the state in administrative, communicative and economic terms. The government of Rafael Correa placed a strong emphasis on elections precisely for these reasons and its continuity depended on sustaining that dominance, making the intervals conducting to elections one of the central markers for the temporal rhythms within the government. It also placed a very strong emphasis on communication dominance²⁴, as some parts of the private owned media became one of the main oppositional forces²⁵, threatening the perceived stability. This tension was translated into Yachay, as we will see in the next chapters. In fact, analysts have deemed Correa’s

²⁴ In this respect, the cases of the Alvarado-Espinel brothers, Fernando and Vinicio, was revealing. They were both part of Correa’s government from the start, moreover, Vinicio Alvarado was in charge of Rafael Correa’s campaign for the 2006 elections and became Secretario Nacional de la Administración Pública in 2007 after the elections. He was “a veteran of previous presidential campaigns.” (C. Conaghan & De La Torre, 2008 p 272.) And his direction was key in Correa’s successful campaign: “Alvarado’s advertising was witty, bold, and eye-catching. Television spots hammered home Correa’s anti-party message by depicting rivals as everything from ravenous animals to clowns, and ending with a simple invocation: “Ya Basta” (Enough’s enough!). Alvarado’s designs turned Correa and PAIS into a brand name, instantly recognizable thanks to the sharp chartreuse color, distinctive lettering, logos, and the slogans used in ads and campaign materials.” (C. Conaghan & De La Torre, 2008, p. 273) <https://www.planv.com.ec/investigacion/investigacion/del-circulo-son-intocables-segunda-parte> <http://www.fundamedios-expedientesp.org/periodistas-que-atacaron-a-la-prensa/la-cabeza-del-equipo-de-comunicacion-del-gobierno-correist/> (last accessed 17/02/2020)

²⁵ One of the reasons for this to happen was that powerful economic groups, some of them bankers who in a way embodied what Correa called the partyocracy, owned many of the mass communication media including TV channels, radio stations and newspapers. These groups translated economic power into social influence and political power. One of the strategies of the government was to write a new communication law that would regulate in detail the communication media; this was a point of contention for years between the government and the opposition. (Source: <https://www.youtube.com/watch?v=BvXJWfTJ9LM> last accessed 16-12-2019)

approach to governing dependant on communicative dominance and the associated electoral strength as a “permanent campaigning”. This was tied to a plebiscitary approach, which never stopped after the successful 2006 elections. In fact, after the elections many of the actors who were in charge of the communicative strategy were enrolled into public official charges (Conaghan & De La Torre, 2008)

This was so because the apparent stability perceived during Correa’s administration can be analysed as such, as an stable period of 10 years, only from the perspective of the present looking back into those ten years. However, during that period, from the perspective of the government that stability could not be assumed beforehand, it had to be achieved, sustained and maintained over time. What was certain for the government coming into office in 2007 was the vulnerability of the political institutions to illegitimate governments and popular upheaval, as well as how the until then political elites had shaped those processes of political domination and economic chaos during the previous 3 decades or so. De la Torre and Conaghan have described Correa’s perception as “a keen appreciation of the precariousness of power” (C. Conaghan & De La Torre, 2008, p. 270) to which I would add an associated appreciation of the volatility, both in the sense of explosive as in uncertain, of the present in political terms²⁶.

So, much more than a potential stability incoming in the near future, Correa’s administration was marked by the immediate past of the country; in fact, as I mentioned previously he won the 2006 elections riding a wave of generalized defiance and exhaustion against the political elites, the congress and numerous corrupt governments (Larrea Oña, 2007; Seligson, 2006). However, now that they were the government, and had to deal both with the expectations of being an unquestionably different government from the ones dominated by the aforementioned elites before, but also to govern, to administrate a state apparatus

²⁶ See for example how in 2015 ex-president Correa back-downed a legislative project that taxed large inheritance and immobiliary speculation, despite having a majority in the national assembly, due to mobilizations against the project of law. Source: https://nuso.org/articulo/las-masas-en-octubre/?fbclid=IwAR0MszeITQyvv7_M0dLUYoHzc3W6wbkOv6UiHBEEFcFV0Eg6E1e_1CZ0cBw (last accessed 17-02-2020)

which as a political party they had never governed before. So, even when the government announced itself as the “citizen Revolution”, they had to deal and decide to use, to activate or not, not only the existent political institutions and historical political practices (see for example the common practice in Ecuadorian politics of rewriting the constitution through constitutional assemblies (Simón Pachano, 2004)), but also the existent public servers and political networks.

This is apparent in how during Correa’s administration there were new figures, for the political sphere of Ecuador, present in his circles of advisors and ministers, but also politicians that had been part of other governments in the past as members of other political parties, who had much more experience in public administration, knew the specificities of the political and legal dynamics of the country, and that could mobilize their own associated connections and networks²⁷. Both composed Correa’s *relational infrastructures*, which will become more relevant in Chapter 5. The main idea is that the perceived stability was constructed and had to be achieved, and maintained over time so both continuing to govern and developing ambitious and resource-intensive public projects with long timescales, were possible. This within a country constantly marked by political sectarianism and the contraction of public policy scope.

Furthermore, the relation between these two elements was mutual: strong investment in infrastructures across all the spectrum: health, education, transport, communication, energy and also in the physical apparatus of the state was perceived from the perspective of the government as a way of sustaining legitimacy, gaining popular support and thus extending their time in government. In a sense, the

²⁷ See for example the figure of Alexis Mera Giler who became one of the closest public officials to Correa and served as “secretario jurídico de la Presidencia de la República” during Correa’s 10 years in office. He was fundamental in shaping and mobilizing the innumerable legal dispositions and norm transformations conducted in those ten years. Mera had also worked in the past as legal advisor for León Febres Cordero, ex-president of Ecuador, one of the major figures of the old political elite and until his death the leader of the PSC (Partido Social Cristiano) one of the political parties to which Correa referred as the partyarchy. <https://medium.com/focus-news-ecuador/el-verdadero-intocable-alexis-mera-11f587ffe68f> (Last accessed 17-02-2020)

potential future stability had to be anticipated²⁸, announced through communicational but also infrastructural commitments. Yachay was a symbol of this conjunction: it both depended on the dominance of the political party promoting that vision of the future and mobilizing the associated expectations, as well as being designed as a “political capital” generator that could contribute in the government’s ambition to win the 2017 elections and extend their time in government. Of course, other means were used to achieve this stability including legal reforms across the state structure from the constitution to the national plans for development, and economic measures such as the renegotiation of the national external debt, fiscal reform and the renegotiation of the terms governing the oil extraction industry in the country.

This sense of stability was also sustained by an economy that also enjoyed a period of growth, despite periodical problems, but still attached to a high dependency on oil exports, a low economic diversification and high income and land ownership inequalities. Based on reforms to the previous laws regulating oil extraction, a renegotiation of the public debt and a high price in international oil prices, again with problematic periods, which enabled the state to enjoy higher incomes, and the role of the state in the national economy became even more central.

3.2.3. The temporalities coming together in Yachay

Public investment during Correa’s administration reached an all-time high, and it was focused on infrastructures: roads, hospitals, schools, hydro electrical plants, among others, were built all around the country. When Yachay was publicly announced in 2010, it was portrayed as one of these projects, but at the same time Correa constantly reiterated that: “Yachay is the most important project in the history of the country”²⁹.

²⁸ See for instance how during 2008 Correa already announced his intention to run for another term under the possibilities generated by the then new constitution.

²⁹ <https://radiohuancavilca.com.ec/politica/2015/08/05/yachay-es-el-proyecto-mas-importante-de-la-historia-del-pais/> (last accessed 18/02/2020)

To understand why, one needs to understand both the futures promised through and in Yachay, but also very importantly the political trajectories that intersected during Correa's government generating a number of political transformations, which allowed the idea itself of Yachay to make sense for the Ecuadorian contexts, which would later shape, and be shaped by the project itself.

Yachay emergence occurred in the middle of the 10-year period, when the government was entering its "second stage" oriented towards the "change in the productive matrix" and the 2017 elections were already in the horizon. Yachay was poised to both embody the long term planning made possible by the stability in government and economic prosperity, a rupture with the economic matrix Ecuador had been following for centuries and provide political support in a way that could secure or at least strengthen the position of the government's party into the 2017 elections.

In a way, when announced Yachay became the setting where expectations regarding the breakdown with the recent past, the connection with a deeper past, the extension of a stable present requiring constant maintenance and the emergence of an improved future society met. I want to highlight this tension between multiple temporalities, almost conflicting, (for example one accelerated temporality oriented towards sustaining political dominance in the short term, was met in the same government with a slower temporality tending to observe long term trajectories, structured on the base on dependencies lasting decades –if not centuries- on certain economic activities, and the intention or at least the discourse of digging deep into the country's economic structure in order to achieve long term transformations) as a key element of the Ecuadorian political dynamics. Rather than identifying one temporality that characterizes the social phenomena at stake (for instance, 'acceleration' or 'sluggishness') I try to pay attention to the multiple temporalities at stake, which may not be synchronous or encompassed, but that are coupled or entangled together, so they resonate with each other. In this sense, I align with Michelle Bastian's call to: *"rather than conforming to a binary thinking encouraged by sustainable times (e.g. fast/slow, short-term/long-term etc.), time became salient*

as a mode of operating across and between disparate values, meanings, actors and hierarchies.”(Bastian, 2019, p. 6). Hence, resonating with the work of Barbara Adam, who *“emphasises the need to explore how different temporal processes or times are entangled with each other through “hierarchical nesting and implication, with enfoldment and resonance”* (Bastian, 2019, p. 18)

In practical terms, this tension was of course a heavy burden to carry for Yachay as Yachay was expected to show results almost immediately that would be indicative of those different temporalities being achieved or at least pursued correctly. This was the case not only with respect to the higher authorities of government itself, due to the above-mentioned political rhythms, but also to the mass communication media. This involved that the results of the project would need to be delivered quickly and at the same time would be highly scrutinized by the media. This generated a double bind in which the managers in charge of Yachay EP, who were the ones responding directly to higher authorities of the national government, needed to both accelerate the construction of the project including the basic administrative infrastructures as well as the more observable infrastructures such as buildings and roads in order to make advances “visible”; and at the same time do it in a way that was not conflictive or aroused political opposition. This led to both narratives and presentations of the project in which the future was collapsed into the present as already imminent in the results Yachay would generate and the visualizations that seemed to be immediately available.

3.3. Yachay’s up-scaling process

When I started to investigate the historical trajectory of the project, it quickly became apparent that the project had taken at specific times in its history a variety of forms as it became increasingly institutionalised and gained the attention, support and credibility of a variety of authorities and groups within the government. These forms ranged from a highly intellectual initiative supported by a small group of people within the government to an established public enterprise with a robust budget and managerial independence from the institutions in which it was born. These

movements and transformations could happen by a combination of projected expectations (showing and arguing what the project could become and what it could change in respect to the past) that were sustained in a variety of narratives, public policies and legal apparatus. Next, the thesis describes briefly these dynamics and how they allowed legal, administrative and political infrastructures to be formed around the project.

3.3.1. Legal, administrative and political infrastructures

An aspect that connects Yachay to a more extended timeframe into the past and situates it within the reconfigurations of a more extensive public policy system are Yachay's connections to a series of legal infrastructures implemented early on during Rafael Correa's government. Yachay was embedded in and supported by the normative transformations of the Ecuadorian state, ranging from the implementation of new legal infrastructures as the 2008 national constitution and the design of the 2010 LOES (Organic Law of Higher Education). Similarly, it emerged within the establishment and reconfiguration of governmental branches such as SENPLADES (National Department of Planning) and SENESCYT (National Department of Higher Education, Science and Technology). Accordingly, the project's trajectory has been continuously reshaped by the different actors that have been part of its history at different moments. These actors, coming from different backgrounds and institutions, brought their perspectives, motivations, interests, expertise, futures and pasts into the project dynamics.

One of the most significant changing contexts in which Yachay emerged was Ecuador's reforms implemented in the realms of education and science and technology policy from the beginning of the Correa government. A range of reforms and programmes were implemented; among them, the Prometeo post-doc initiative³⁰ (SENESCYT, n.d.; Van Hoof, 2015), national and international scholarship

³⁰ The Prometeo initiative is a research oriented fellowship program implemented in Ecuador from 2008, which aimed to bring to the country both international academics and Ecuadorian researchers

programmes, reforms of both planning and regulation institutions such as SENASCYT/FUNDACYT, the creation of a national plan for development, public research funds, and the construction of new educational infrastructures in the form of new schools and new universities (for a systematic overview and a historical comparison see (Herrera García, 2018) and (Chavez, 2017a, 2017b)). These reforms were connected to ex-president Correa's view, based on his personal experiences and trajectory within that system and his political motivations, that Ecuador's education system, and its lack of connection with the generation science and technology policy, was one of the main barriers stopping the country from achieving greater wealth and wellbeing. In his eyes, it was too fragmented, overly privatized and almost entirely teaching-oriented, leaving research as a peripheral activity. In his words:

All my life, before being a politician, I was an academic, I had the opportunity to study in Ecuador and teach in many Ecuadorian universities. Thus, I know very well the Ecuadorian University, and I had the opportunity to study in Europe, in Leuven, and afterwards, I was in the United States. I know that our university system was terrible and I know where the problems were. In the twentieth century, the countries that develop the most are not those that have the most land and natural resources; they are the ones with the best human talent, science, technology and innovation capacity. For that, we need first level Universities, while Latin America does not improve its level of university we will not overcome underdevelopment. (Correa, 2018)

who lived abroad, in order to promote knowledge transfer into Ecuadorian universities and strengthen the nation research potential (Pedone & Izquierdo, 2018; Van Hoof, 2015). This is how Ecuador's government describes the program: *"The Prometeo Project is an initiative of the Ecuadorian government that seeks to strengthen research, academy, and knowledge transference in specialized topics through the incorporation of foreign and Ecuadorian experts (who live abroad) to different host institutions. It is aimed at universities, polytechnic schools, public research institutes, and other public or co-financed institutions that require assistance in the development of research projects in priority areas of knowledge."* (SENESCYT, n.d.)

Of course, this was not only his perception; Ecuador's education system had problems inherited from previous decades. His specific interpretation, which highlighted certain aspects and left others aside, was a vital component of this framing as he was the acting president and his influence across the government and in Alianza País could hardly be overemphasised (Basabe-Serrano, 2009; Meléndez & Moncagatta, 2017; P. P. Ospina, 2008; Polga-Hecimovich, 2013). Hence, this depiction of the past was one way of interpreting it in order to make decisions in the present, and in that way mobilising specific ways of representing pasts to explain present conditions, and by doing so, setting a context for future-oriented actions. These representations implied highlighting certain aspects of the past, and leaving others aside, in order to generate a connection with a present in which Correa's party had both the political dominance and the economic resources to implement changes in public policy. These changes were oriented towards the reconfiguration of the Ecuadorian state and change its historical interrelation with other social spheres such as academia, social movements and mass media (Becker, 2013; Lemos, 2014).

In this sense, expectations of what would be Ecuador's educative system in the future were inseparable from those representations and mobilisations of pasts. Those interpretations of the past allowed the emergence of meaningful lines of action, for certain actors, in the present, which would allow the future to emerge as different from those pasts. Hence Alianza País insistence on the new country they were creating, see for example the slogans often used during campaigns and political events³¹: "la Patria Nueva" (the new homeland-motherland) or "Ecuador ya cambió" (Ecuador has changed), "el futuro no se detiene" (the future cannot be stopped)³². Also, in the plan of governance of Alianza PAIS:

Let's fight all together, compañeros and compañeras! So
November 26, 2006, is a new historical date, the birth of a new

³¹ In fact, in Alianza País' government plan developed for the 2006 elections you can already see this at play, as one of the main titles of the document it can be read: "¡Porque otro país es posible! Un primer gran paso para la transformación radical del Ecuador" (Alianza País, 2006, p. 2) (¡Because another country is possible! A first great step for the radical transformation of Ecuador")

³² A collection of videos using these slogans can be seen in this youtube channel Ecuador Ya Cambió.

Homeland to demolish the old structures, as a previous step to the construction of a different society; make no mistake, the urgency of change is historical and subversive, because we are not interested in maintaining the current state of affairs. (Alianza País, 2006, p. 14)

However, this was not coined by Alianza País in a vacuum. It resounded with the political struggle of a variety of social movements and organisations from civil society that demanded: “Que se vayan todos” (all (politicians) go home!)³³. Both Correa and Alianza País made strategic use of this collective call when they referred to their government as “La Revolución Ciudadana” (Citizen Revolution) and thus setting the expectations surrounding the word revolution as a critical component of their government, at least in discursive terms. This political imaginary of pursuing and demanding a future “clean page” from which to restart, and the connected political mobilisations of historical memory have a long history in Ecuador (Amorebieta y Vera, 2017) but this is not the topic of this thesis. I just want to highlight this as an important element of Correa’s government temporalities and how these elements came into play in Yachay later on.

The idea is to highlight that expectations were acting more as interfaces between pasts and futures, rather than only being directed to the future. In a way, expectations can also be read as interpretations of how the past could, or in other cases “must” had been, in order to explain or justify a present. A present, that when mobilized for collective action is no longer just a personal “now”, but an emergent resource for political action, whose specific actors, in this case, president Correa and his government, use to mobilize whole temporal horizons (a partially stabilized way of reading social reality through the lens of the difference between pasts and

³³ Interestingly Correa’s government is now framed as the immediate past with which the current government has to break, and its legacy is under continuous dispute, while many of his followers and himself continue to refer to it as *la década ganada* (the won decade) other political actors including the current president Lenin Moreno, who served as Correa’s vice-president for years, refer to Correa’s decade in power as the *década perdida* (the lost decade)(El Universo, 2019).

futures). This is part of what Rufer, Sharma and others have referred to as temporal politics or the social politics of time (Huebener, 2018; Rufer, 2010; Sharma, 2008).

Regarding education, the 90s saw the emergence in Ecuador of a high number of privately owned profit-oriented universities, mostly unregulated by the state (Cielo, 2019, p. 61). During this period, public investment in public education institutions was constrained, especially funding for research. From 2007 onwards, Correa's government introduced more significant investment of public funds into higher education, as well as a stronger regulatory framework characterised, for example, by university evaluation and accreditation by governmental institutions. In the words of one of the interviewees who was at that time a key actor in the evaluation process: *"We wanted to enter a depuration process of the higher education system"* (Public Authority 1, personal communication, 2017).

This strengthened interrelation between the state and universities set limits to the autonomy of higher education institutions, both public and private. One of the main aspects of these educational reforms was the acceleration which accompanied many of these changes, as the goal was framed as achieving structural long term changes which generated visible and significant results on a short time-frame. This can be seen in the intensive nature of these policies and in the variety of policies applied to achieve short-term impact: programmes for national and international scholarships, the Prometeo post-doctoral fellowship program, the general evaluation of the whole higher education system, the introduction of a new law of higher education, the creation of 4 new emblematic universities, among others. Nonetheless, sustaining both these short-term and long-term horizons, and achieving them, was particularly problematic in a context of high economic fluctuation and structural political instability. Government authorities close to Correa, and the ex-president himself thought that generating a state-led rapid change in the existent higher education system would trigger a more substantial transformation of the Ecuadorian society as a whole into the future ³⁴. This focus on the educational system led to the creation of

³⁴ As with respect to many of the early political and economic changes which Correa's government implemented, or in other cases tried to implement, the perceive need for a change in the general

4 new “emblematic universities”, one of which was a technical research-oriented university which would later, after reconfigurations, become YachayTech. During our interview, ex-president Correa framed this connection between a transformed educational system in the future and the goal of triggering a more structural transformation, connecting it with his personal experiences, in the following way:

The strength of the United States is its universities; I studied there, which generate science, technology and capture the best brains in the world. The greatest strength of the United States is technological strength and innovation, hence the financial and military strength. That is the key to development, I always knew, from the beginning our effort was to improve education at all levels... I knew Louvain, my dream was to make a university like that in Ecuador, but we were not fooled either: there are priorities, I know that this can offend many, I am a social scientist, but with scarce resources, you must have priorities. We invest in hard sciences; we need hard sciences more than philosophy. Therefore, a University oriented to hard sciences. (Rafael Correa Delgado, personal communication, 2018).

As we can see, the transformations and the expectations regarding an improved educational system, were not only tied to ambitions about the future and the application of foreign models, but also to specific ways of understanding and mobilizing the past³⁵, previous conditions and what authorities considered to be the

structure of the education system in Ecuador was supported by decades of unrest and dissatisfaction of a variety of social movements and political forces in Ecuador. Not the least of them, the indigenous movement and groups of minorities which had been systematically excluded from all levels of education and from higher education especially. Expectations around this transformation emerged in this context, this was recognized by Alberto Acosta, who served as president of the Constituent Assembly during the making of the 2008 constitution (Alberto Acosta, 2008). This can also be traced in Alianza País’ government plan of 2006 in which education was already positioned as one of the biggest pillars of the promised transformations (Alianza País, 2006, pp. 59–62).

³⁵ I want to note here that I interviewed ex president Correa in Louvain-la-Neuve where he went to live with his family after he finished his term as president. As mentioned before, he had lived there during his youth, he studied there and met his wife there, and it was clearly a very significant place for him. After our interview, we walked through the city while he showed me the different buildings of the University, and explained how it was all planned. Later, we went on a drive around the science

existent conditions in Ecuador's education system. Hence, both pasts \ futures were combined to trigger the emergence of a present that "demanded" action or at least one in which specific actions made sense to certain actors.

This is the case of the formulation of the 2010 LOES, which at the same time established how already existing universities would be evaluated and regulated, and those that failed the process would be closed³⁶, as well as stating the future construction of the 4 "emblematic" universities legally. The inversion of a substantial number of public resources on the creation of these universities would become one of the sources of tension between the central government and the higher education institutions as many academic actors considered it a sign of contempt for the existing universities, their experience and human resources (Chavez & Gaybor, 2018; Villavicencio, 2014). Many of these actors argued in favour of those resources being used to improve the existing universities, but the LOES declared a wide-ranging evaluation for the whole university system, forclosing in that way the possibility to invest that amount of resources in Universities which would have to be evaluated in the next years. Additionally, the ex-president and other actors from the government sustained a vision, which is connected to a recurrent foundational narrative, in which *"the concept was: it is better to start from scratch doing it well rather than to try to fix what is already wrong."* (Rafael Correa Delgado, Personal communication, 2018).

This focus on education was already present in the 2008 constitution, which denominated education as a constitutional right, of primary importance for public policy and a strategic resource in order to achieve Buen Vivir (Ecuador, 2008 Art. 26). The constitution would serve as a political infrastructure and legal base for implementation of several projects, introducing new regulations, public policy

parks, which surround the city, and during our conversations, he continuously mentioned the connection he aspires to achieve between Yachay and Louvain-la-Neuve. He was employing his own experiences of this place both in the past and as he perceived it in the present, to explain both the past of Yachay, in the sense of its initial concept, and what Yachay was "meant to become". Again, expectations were embedded in personal experiences, in the mobilization of pasts to make sense of a present and to make a potential future observable, and actionable.

³⁶ During 2014, 14 Universities were closed after the evaluation process and the authorities from the new government confirmed in 2017 that they will not be reopened.

programs and physical infrastructures, among them the project that would eventually become Yachay.

The government started to roll out a reform of the previous Higher Education Law, based on one of the new 2008 constitution's transitory dispositions (number 20) (Ecuador, 2008). Based on these mandates, the government planned to restructure the regulation and the guiding principles of Ecuador's superior education system and conduct a general evaluation of the existing Universities. Official debates in the National Assembly about the new proposed Organic Law for Superior Education (LOES) were in place during 2009, the specific dates appearing in the document are the 12th and 17th of August 2009 (Ecuador, 2010)³⁷. Nonetheless, the LOES was far before already being discussed and drafted within SENPLADES and other governmental arenas.

3.3.2. Infrastructuring Yachay

One of the critical points of the LOES to understand the infrastructuring of Yachay is one of its transitional dispositions, number fifteen, which would eventually get published (Ecuador, 2010)³⁸. This prohibited the creation of any new University in the following 5 years after the promulgation of the law, with the exception of 4 government-funded universities, one of which was described as: "a research and

³⁷ Van Hoof et al., describe some of the biggest changes LOES drawn in the LOES as follows: "public education, from the lowest to the highest levels, would be free to Ecuadorian citizens. This changed the funding and administrative structures of Ecuador's public universities from tuition-based and relatively autonomous to complete dependency on the central government with regard to budget allocations, student admissions, and administration. A second major development impacting higher education was the adoption of the Higher Education Law in August 2010. This law sought to increase the regulation of the country's universities even further by increasing their accountability to the central government and by bringing their research and educational efforts more in line with the country's social and economic development needs. It created three national institutions to oversee the country's institutions of higher education, approve new degree programs, regulate student admissions, distribute state appropriations to public universities, stimulate research activity, and accredit existing academic programs and universities." (Van Hoof, Estrella, Eljuri, & León, 2013, p. 346)

³⁸ "Fifteenth.- During the five years following the promulgation of this Law, no new institution of higher education will be created. The National University of Education "UNAE" is excluded from this moratorium, foreseen in the Twentieth Transitory Provision of the Constitution, whose matrix will be in the city of Azogues, Province of Cañar; the Regional Amazon University, whose headquarters will be in the city of Tena, Napo Province; the University of the Arts with headquarters in the city of Guayaquil and an experimental technology research university." (Ecuador, 2010)

experimental technology University”, which was the initial form of Yachay, but on a much smaller scale than the one the project would take eventually. While these universities were planned, the whole rest of the higher education system was under evaluation. In contrast to the other three Universities (a University for the Arts to be constructed in the city of Guayaquil, the National University for Education to be built in the city of Azogues, and a Regional Amazonian University to be built in the city of Tena), the location for this Research and Experimental Technology University was not determined. The creation of these four new universities rode in the waves of expectations tied to the generation of a new education system, based on the constitutional reforms, which would hypothetically allow Ecuador to progress historically.

When talking with some of the actors that were behind the creation of the 2010 LOES I realized that the idea behind these universities emerged within ongoing intragovernmental debates and negotiations regarding what they conceived as the state of education and its relation to development at that time in Ecuador (Van Hoof, Estrella, Eljuri, & León, 2013). In a way, it illustrated how they represented the pasts that they had received from previous governments, and what future lines of action they wanted to pursue as both solutions to those pasts and as a way of generating a new present, rapidly. It has to be noted that all of these movements were not debated only concerning their economic costs and expected results, but also to what one of the interviewees who worked in a high position of the government called the “political capital cost” (Public Authority 3, personal communication, 2017). This was both the risk involved in taking decisions or generating dispositions which could mean losing political support in the short term, as well as potentially winning additional support in the future as a result of the success of these projects. This overall political capital was mainly measured, or made partially observable, through elections; hence, as mentioned in the introduction to this section, the dates of elections were one of the main temporal reference points around which much of the government’s plans were organised and visible results expected.

Moreover, the idea supporting the creation of this “research and experimental Technology University” was to achieve a very short latency, understood as the time between an already occurred action or event and its effects become visible in the present, between its creation and the University’s articulation to the international channels of academic collaboration and production, in other words, the triggering of the generative effects it was expected to have:

“a university that could anchor to the world system immediately [...] with all professors having a PhD, most of them with experiences in first world universities and all those academic dynamics. So, historically, the project evolves first with the ratification of the Organic Law of Higher Education and the exceptionality of creation of universities included in it, specifically the Research and Experimental Technology University, which is how it was called specifically in the law.” (Public Authority 2, personal communication, 2017).

Here, Michelle Murphy’s work around latency becomes relevant. Latency is understood as the time between an already occurred action or event and its effects becoming visible in the present (Murphy, 2013, p. 1). In this sense, expectations here were not only structured around the consecution of envisioned futures but also around the speed at which those futures could be achieved, and the speed at which the effects of reforms-decisions implemented in the recent past could trigger the emergence of those futures. Latency was expected to be reduced to a minimum. This resonates with ex-president Correa idea of creating Yachay, as a university, which could almost immediately stand on its feet and run:

That was the central idea of Yachay: to be a University that from the first moment had international standards, the highest standards to choose a rector who had publications in journals indexed worldwide, authorities with a world-wide scope, a board of trustees with leading academics, with candidates for Nobel prize, etc. We wanted all

teachers to have a PhD because it is easier to create something right from the beginning than to correct something that is already wrong.
(Rafael Correa Delgado, personal communication, 2018).

The idea was to create a University that could both compete at an international level and be the flagship of a new Ecuadorian higher education system. Although the project implied taking economic and political risks in a governmental landscape which had been historically volatile, and the idea was not totally welcomed at the beginning³⁹ as the existing educational system would probably oppose, but the idea had the personal support and endorsement of the president who was willing to take risks in the creation of these universities. Also, the resources were available, and political gains could be equally significant.

3.3.3. The scaling up of Yachay

Simultaneously, this plan was presented to several public authorities and their respective assessors, in order to get feedback and socialise them, between them was a public official ⁴⁰ who then worked as an assessor in SENPLADES and had previous experience in Ecuador's Ministry of Industry and Production. Interestingly, he also had experience in a variety of private companies and had a robust academic background training in economics in Ecuador and the USA. Hence, he had experience working within the public sector, in private companies and the academic realm. He, as a number of other assessors, were approached by high authorities of the government who had been involved in the debates around the new emblematic universities and were asked for their perspective on the government's plan to build a researched-focus University which could provide a centre around which high-level academic research could be developed in the national education system. This SENPLADES advisor revised the proposal and was not satisfied with its scope and the

³⁹ This can be traced in the debates surrounding the LOES, for example an earlier draft proposal from the 26th of August of 2009, two of the four emblematic universities do not appear in the LOES. (Senplades y Conesup, 2009)

⁴⁰ The person in specific has asked to be anonymized. Nonetheless, I have compared he's testimony with public records and other informants rendition of the process.

vision of how this academic institution could be relevant for that moment in Ecuador's context, in his words: "*I told them right away: that does not work.*" (Public Advisor 1, personal communication, 2016). In his perspective, creating an elite level research university in Ecuador would be useless, with no social impact, since the country lacked a national innovation system to support a market value and industrial application to the potential research realised in the envisioned university. He had in mind a much more ambitious scope:

It does not make sense to create a scientific and technological research university in Ecuador only for the sake of creating it, only as a university. If you did not develop at the same time the industrial sector, the business sector, the academy, not as a university but the academy at a global level, if you do not develop technological, technical institutes. It does not make sense if you do not generate dual training, it does not make sense if you do not have or develop a technology park, and it does not make sense if you do not support everything that constitutes the entrepreneurial movement and the innovation system. (Public Advisor 1, personal communication, 2016)

According to him, if this university would be created alone, it would become an isolated island within an education system that was not research-oriented, a context in which private companies were not used to invest in research and innovation, and a public sphere with little experience in triggering innovative links with other actors. His comments were received with both surprise and interest: "*you are crazy, just crazy, they said.*" (Public Advisor 1, personal communication, 2016).

The advisor was asked to incorporate his comments on a model that could be meaningful and relevant for the Ecuadorian context; to show in brief a model how this technical university should be reimagined. He got little time to do it before he had a strategic meeting with René Ramírez (at that moment in time the director of SENPLADES and one of the persons in the government closest to Rafael Correa and who accumulated enormous power and influence). According to this advisor, he got

to work immediately, seeing in this a unique opportunity since the government had then both the political and economic resources to invest with an ambitious scope. Additionally, this project resonated precisely with the kind of work he aspired to do; during our interviews, he described himself as *“a man who wants to get things done in order to really contribute to change Ecuador”*. What he developed was, in his words, a *“tropicalized version”* of a Triple Helix model, to which he incorporated two more helices that were indispensable for him when thinking about Ecuador’s context: community and environment. He explained:

The development model in Ecuador has to be a pentagonal model where the state, the academy, the private sector are involved, but you must also involve the community and an environmental perspective! Without that development model, anything that is done won’t work. You have to understand the importance of involving and linking community factors, it is necessary to involve that process. (Public Advisor, personal communication, 2016)

In his model, the technical university with its campus was scaled up into a city, Ecuador’s first planned city in centuries, surrounded by all the elements he saw missing in the initial plan for the technical University; *“you have to involve everything I mentioned, in other words, you have to create a city, a new city, Korea style. However, tropicalized to Ecuador, zhumirized to Ecuador. It has to be all zhumirized.”* And what was initially imagined as a University that could run as soon as it got into its feet, was reimagined within the scope of an intergenerational change whose effects would not be seen in the close future and that depended on what he called a series of *“saltos cortos”* (small jumps) rather than fast-trackable transformations:

You cannot enter immediately to produce nanotechnology in a country in which we are not nanotechnologists, we do not have that habit, and we do not have that background. We have to start from what we have [...] the change of the productive matrix is generational, it is not overnight, and it does not come with a

project. It comes through generations; it is a process that lasts 20, 25, 40 years. It took Korea 30-40 years to change its primary export function to what they are today. It is a generational change, which basically comes from the conditions that you give to universities to enter research processes that take years of research processes applied to the development of your region and based on the realities of your region and your industrial sector. (Public Advisor 1, personal communication, 2016)

René Ramírez and other authorities in SENPLADES analysed the brief proposal and were interested in the potential of the suggestions oriented towards a reconfiguration of the initial idea. A team was conformed within SENPLADES to develop the new concept with this public advisor as the person in charge; he was hired as a consultant to develop the model for a “Zona Económica de Desarrollo del Conocimiento y Nuevas Tecnologías de Comunicación e Información para el Ecuador”⁴¹. Among other reasons, authorities saw in the new proposal a project that could connect the legal transformations triggered by the educative reform into a broader impact in the economic structure of the country; an impact on the pursuit of what government authorities referred as the “change of the productive matrix”. As he mentioned, he saw this process as taking a much longer time-frame and being more incremental rather than drastic. However, there was tension from the start between the political rhythms and speed imagined and set by the government and the conceptual apparatus being developed for the project. Government authorities wanted a more immediate future, a reduced latency between present action and future effect, which could, of course, be visible and presentable as identifiable material progress as soon as possible. The very word change of productive matrix implied a foundational relationship with social reality that could conceal the need to build on the base of what already existed. Additionally, the different actors, including the named public officials, were working

⁴¹ The public advisor outlines his academic and professional experience in his curriculum vitae (Public advisor 1, personal communication, 2016) which I have compared with official records of both SENPLADES and SENESCYT, and other informant’s accounts.

within multiple time-frames, at the same time within the scope of a distant future but dealing in the present with the maintenance and advance of their own interests and political trajectories.

A small team, headed by the previously quoted public advisor, was organized to work on the reconfiguration of the initial plan of a “Research technical university” into a project which contained academic as well as public and private sector actors, the new scope of the project increased the required resources, risk and the space required for the implementation. During early months of 2010 they presented the new concept to the president and Correa was convinced with the expectations embodied in it, during April 2010 SENPLADES was declared officially in charge of the design of the project. The team working in SENPALDES took inspiration from a variety of sources, some from personal trajectory such as the mentioned advisor’ experience in Utah State University and from his academic training -among which he had received training in industrial policy in Korea. Hence, his reference to the Korean experience was not only conceptual but experiential. In other words, his vision of Ecuador’s sociotechnical future was interlaced with his experience and understanding of past trajectories, and the way he mobilised both in the present. The initial idea of a technical and research university was initially transformed into a *Ciudad Universitaria* (University City), which was also referred to as a *Ciudad tecnológica de investigación* (Technological Research City), that contained besides the university an industrial park, a technological park and a zone for urbanistic development (see figure 3). The new model was presented to higher authorities and the president during internal meetings, and it was supported by the president even when others had doubts. This support was translated into a presidential commitment in which SENPLADES was put in charge of the development of a plan for the implementation of a *Ciudad Universitaria* in an alliance with an international company or academic institution (SENPLADES, 2011b).

Expectations were at the driving front of these processes, i.e., representations of future states of knowledge and technological development that could bring together private, public and academic actors as never before in the history of Ecuador.

Expectations of a past finally surpassed and a future in which Ecuador could connect to the world system, and its unravelling transformations, through other means.



Figure 13. Screen capture of a representation of the Ciudad Universitaria or Ciudad tecnológica de investigación presented by ex.president Correa on the 7th of August of 2010 during his weekly report Number 182. (Audiovisual, 2010, min. 1:01:00)

One of the aspects highlighted during those early design reconfigurations was the need to have international support and advice for the project as the Ecuadorian academia and government had no previous experience developing a project of this scale. Correa during the weekly report 182 mentions that they are looking internationally for alliances in order to build a “tripartite alliance between the state, with an academic institution from the first world that can provide us with researchers and academic standards, and one or several private companies”(Audiovisual, 2010, p. 1:03:00). Then the Korean case, not only as a particular city or project but more broadly as a historical exemplar of the development of a set of public policies and alliances between private and public actors, became more relevant. The Korean case was already present within discussions regarding public policy and science, technology and innovation promotion internally in Ecuador’s government as it was perceived as an example of a country which had rapidly advanced its economic

structure through a process in which the government had been a protagonist. Moreover, the LOES was about to enter into discussion in the National Assembly, and the idea of following a Korean inspired model was becoming influential in the government in general.

During September 2010 Rafael Correa visited Korea⁴² and Japan in an official visit tour which had been announced months in advance in search for alliances, investment and international cooperation in a variety of topics ranging from renewable energy to investment in the Refinería del Pacífico (an enormous oil refinery planned to be built in the coast of Ecuador)⁴³. The team behind the reconceptualisation of the project of Yachay managed to include in the president's itinerary a visit to KIST (Korea Institute of Science and Technology)⁴⁴ and Incheon, which were, in their minds, materialisations of the ideas they were developing.

During the trip to Korea he visited several cities, including Songdo, and a variety of industrial complexes⁴⁵, to negotiate cooperation between the two nations in a variety of topics, mainly around energetic investment from Korea in Ecuador⁴⁶. Correa became convinced that this was the kind of project his government needed: a project which combined both the educative transformation his government had promised and the "change in the productive matrix" which had become the guiding sociotechnical imaginary within the government.

⁴² Correa was invited far in advance to this visit, in fact as early as Correa's introduction day to office he received a formal invitation of the South Korean government for an official visit (MOFAT, 2009).

⁴³ <https://www.eltiempo.com.ec/noticias/ecuador/4/rafael-correa-anuncia-visita-oficial-a-corea-del-sur>, <http://www.prensaislamica.com/nota5033.html>, <https://www.youtube.com/watch?v=4pkP5f6316o>, <https://www.youtube.com/watch?v=qoeYvuSb1X0> (last accessed 12-02-2020)

⁴⁴ https://eng.kist.re.kr/kist_eng/?state=view&sub_num=417&searchKind=&searchWord=&v_pageSize=10&v_page=22&idx=-81437&seqNo=211&reportMediaTypeCode=
<https://www.businessghana.com/site/news/business/121559/Ecuador-S-Korea-excellent-business-partners-President-Correa> (last accessed 12-02-2020)

⁴⁵ <https://www.eluniverso.com/2010/09/08/1/1355/correa-interesado-conocer-milagro-economico-surcoreano.html> (last accessed 12-02-2020)

⁴⁶ <https://www.elboletin.com/latinoamerica/25624/rafael-correa-cierra-gira-asiatica-busca-inve.html> (last accessed 12-02-2020)

During November 2010 official cooperation was established with Korean advisors from IFEZ⁴⁷ (Incheon free economic Zone), a Memorandum of Understanding and exchange of experiences was signed between SENPLADES and the Special Economic Zone Authority of Incheon (IFEZA) to promote the design and implementation of a Special Economic Zone of Development of Bio-knowledge and Communication and Information Technologies, which would be called the City of Knowledge in Ecuador. During the next years, a Master Plan was developed between the advisor team from IFEZ and an Ecuadorian team working in SENPLADES, and later on in SENESCYT. As a product of this closer interaction, the previous idea of a *Ciudad Universitaria* (*University City*) scaled into that of a *Knowledge City*, hence the name Yachay the city of knowledge. This change did not come only in the name of the project but also the scope of the project changed and with it the scale of resources involved; the city of knowledge model was conceptualised to require at least 4000 hectares, while the previous plan for the Ciudad Universitaria was, as mentioned before, 200 to 300 hectares^{48 49}. The urban aspect of the project was strongly highlighted with the Korean influence, specially the line of urbanism related to knowledge cities and knowledge-based urban planning which can be traced back to the 90s and across a variety of regions in the world ranging from Australia to Rumania, but that is nowadays more associated with Asian urbanism and knowledge-economies (Elena, 2015; T Yigitcanlar, Metaxiotis, & Carrillo, 2012; Tan Yigitcanlar, Velibeyoglu, & Martinez-Fernandez, 2008). This type of cooperation has been analysed within the idea of “south-south cooperation”, the internationalization of Korean and Chinese

⁴⁷ IFEZ have used this cooperation as a platform on which to promote and generate their own expectations, see the note on their Journal on 2012: “The entire world is now paying attention to IFEZ’s successful development model” (IFEZ, 2012, 6-7).

⁴⁸ “Por otro lado, haciendo hincapié en el pedido hecho desde hace dos meses, solicito el cambio de nombre del compromiso “ciudad Universitaria” a “Ciudad del Conocimiento”, ya que con esta denominación damos cuenta de una dimensión superior del proyecto que trasciende la construcción de un campus universitario, hacia la creación de un polo de desarrollo científico tecnológico que involucra también a actores empresariales, comunitarios y a los centros de investigación, desarrollo y transferencia tecnológica.” (SENPLADES, 2011c)

⁴⁹ This can be observed in the Informe Ciudadano 182 (weekly reports in which the president and members of the cabinet informed, on national television, about their weekly activities).

sociopolitical influence and the circulation of Asian urban models across Latin America and Africa (Chavez & Gaybor, 2018; Noorloos & Leung, 2017; Yoo, 2012).

During this process two teams were established to generate the model that Yachay would pursue, incorporating the recommendations and experience from IFEZ as well as the specific aspects that the Ecuadorian team from SENPLADES-SENESCYT⁵⁰ were interested in pursuing, which would make, from their perspective, the project feasible and meaningful for the Ecuadorian context:

We proposed the following: we are not interested in you (in respect to the Korean team) coming and giving us the material only, we told them let's create two teams, one of you in Korea, and one here in Ecuador. You are going to do the transfer of technology and knowledge to the Ecuadorian team, and we will tropicalize it as we go. We worked for months putting together the whole conceptual scheme and the development plan and planning for the next 25 years, with investment planning per year, how it had to be done, and planning the growth of the city by stages. We generated the whole concept together with frictions and all. (Public Advisor 1, personal communication, 2016)

The result of this cooperation is Yachay's Master Plan, presented in its final version to the government in November 2013 (IFEZ-Ecuador, 2013). It contains the long-term vision of the project for the next 35 years and states that it will be developed along a period that started in 2010 and will run at least until 2045. This time-frame is divided into four phases, and Yachay is already in its first stage that runs until 2019 and has

⁵⁰ On December 5, 2011, SENPLADES transferred the obligations, rights, attributions, functions, responsibilities, financial resources, information and other documents of the City of Knowledge Project to SENESCYT. Along with this transfer, a number of public official migrated from SENPLADES to SENESCYT, including René Ramírez and one of his assessors, Héctor Rodríguez, who would become increasingly involved in the project and would eventually be named the general manager of Yachay EP in March of 2013.

been named “the dynamisation phase”(Yachay, 2013b, p. 3). Comprised within this phase are the following: the construction of YachayTech, building residences for at least 4500 students and 200 instructors, the edification of the first installations for the research clusters and all the infrastructure regarding essential services and mobility(Yachay, 2010). This phase points to build strong foundations for the project in order to allow successful future expansions by “providing the infrastructures and main construction of the industrial research centres, the University and the residential areas in order to meet basic needs”(Yachay, 2013b, p. 4).

Correa saw the project as the kind of development that could transform Ecuador’s economic matrix, reconfigure the terms of its connection with the world system and fit perfectly into what he read as the particular context of the Ecuadorian economy and the line of government he had pursued during his mandate. The principles of Yachay as elaborated by the small team working in SENPLADES, explicitly embodied the principles of the National Plan for Buen Vivir (Senplades, 2009). They pointed to a model of innovation centred not only on private actors but heavily promoting the potential role of the state in this processes, and the limited initiative of private actors in Ecuador’s economy especially with regards to investment in science and technology research. Among other principles, it embodied the idea of generating new economic poles for the country to move beyond centralisation in Quito and Guayaquil, what technicians from SENPLADES called “Ecuador’s polycentric development”. This representation of the contexts at stake and the lines for future action to be pursued aligned with Correa’s representations of pasts and futures:

Some also criticise Yachay saying we are statist "Why not like silicon valley?" They do not understand the specificity of Latin America. In Latin America, the private sector is very weak: it does not invest in research and development. In a country like Ecuador, the one that generates resources is the state, not because it is great, but because the oil is from the state. Then, another model is needed, not that of Silicon Valley. A model driven by the state, a public university, with facilities and incentives for the private

sector to go to. From the Ecuadorian private sector, a project of the magnitude of Yachay was never going to emerge. (Rafael Correa Delgado, personal communication, 2018).

The model generated from the modification of the initial idea of the technical University would resonate at a personal level with the experience of ex-president Correa, who had studied part of his university life in Louvain the New, there he met his wife, and after his presidency, it became his place of residence. During the development of the model for Yachay, Leuven the New became one of the benchmarks for Yachay, especially in the design stage of the city model and the projected role of the University in it (Clave, 2014). Importantly for this analysis, this opened the door for a represented past to be actualised in Yachay, where the present was directed and mobilised towards places and experiences like Leuven the new. For example, during Yachay's design, several cities were visited worldwide, one of them being Louvain-la-Neuve. The personal experience of the former President Correa allowed him to connect the expectations of a possible future for Ecuador that was presented to him in the New Model of Yachay with a city that already existed and that he knew well from personal experience. This connection between past and future strengthened the link between Yachay and the government of Rafael Correa, it gave the expectations credibility and thus made the project viable in terms of political legitimacy.

Once the president approved and supported the idea and the concept was turned into a project, the mobilisation of expectations begun for Yachay 'the city of knowledge', long before the Public Enterprise (EP) was even created. In the first tweets of the presidency about the project, Yachay was announced as being part of the second moment of the Revolución Ciudadana and immediately linked it to Rafael Correa's administration. The first tweet I could trace goes back to December 2011:

"Yachay is the nation's most important project. Let's everyone support this project, which belongs to the second phase of the RC (Revolución ciudadana - Citizen Revolution). President #Correa #Macas".
(10th of December of 2011)

All of these were examples of how representations of the future of the project and of its impact on both the region in which it was going to be implemented and for Ecuador more generally were continuously being interlaced with representations of the past. As highlighted by the literature, the use of expectations aimed at attracting attention, resources and commitments (Brown et al., 2003; Konrad, 2006); and it achieved it effectively within the government which at this point was the most significant funding source for the project.

On March 13, 2013, the Public Company, Yachay Empresa Pública “Yachay EP”, was created by the Executive Decree 1457 published in the Official Record Nr. 922 of the 28 of March 2013. A symbol of the new public company was added to Yachay’s previous logo. With the creation of Yachay EP, the project gained autonomy from both SENPLADES and SENESCYT. It gained a large number of resources upon its creation. Yachay was incorporated both into the National Plan for Buen Vivir and in the national strategy for the change in the productive matrix; the guiding plans in Ecuador’s periodical planning system (SENPLADES, 2013, 2014). This was a key step in a continuous process of reconfiguration of the visions and ambitions embodied in the project, which overlapped with the legal and political infrastructuring of Yachay across time. In this process, expectations worked as interfaces through which multiple actors connected, sometimes complementarily and other disruptively, pasts and futures related to their trajectories and those of Ecuador’s contexts at play.

3.4. Chapter conclusions

This chapter has focused on describing the economic and political trajectories of Ecuador coming into play in Yachay through the government of Rafael Correa. The second section of the chapter traced the up-scaling of the project from a technical university into a city of knowledge by analysing the use of expectations during the intragovernmental negotiations surrounding the project. The central focus has been understanding how expectations were used as potent resources that allowed for the negotiation and mobilization of both pasts and futures. In the next chapter, this

process is going to be exemplified through a different entry point connected to the implementation of the initial physical infrastructures in Yachay.

CHAPTER 4. Yachay's early implementation

4.1. Introduction

To recap from the previous chapter, Yachay was intragovernmentally up-scaled from being initially imagined as a Technical University with a research orientation to achieve fast impact, one of the 4 “emblematic” Universities the Correa administration was planning to build, to a City of Knowledge in which the university still existed alongside an entire new sustainably planned city, and both industrial and scientific parks. This up scaling meant both an increase in the ambition of the project, the time-scales involved for the expected impact, its prominence in public discourse as well as an increase in the required economic, administrative and political resources to implement it. Throughout this whole process, expectations had a fundamental role by connecting both specific actors’ understandings-experiences of Ecuador’s recent and long-term pasts, with the narratives and prospects of what the country could/should become in the future, and what future capabilities would be made possible by and in Yachay. This was a contingent process, shaped by the intersection of trajectories and negotiations, which illustrates the reconfigurations of the project’s scope and concept that happened within the government, and more importantly for this thesis, the roles that expectations accomplished in it. Yachay as a project was initially conceived within SENPLADES (the national secretariat for planning and development); later on, it was transferred to SENESCYT (the national secretariat of higher education, science and technology). This transition happened in parallel with the inter-institutional migration from SENPLADES to SENESCYT⁵¹ of a group of government officials that had been at the head of SENPLADES, namely René Ramírez and Héctor Rodríguez, and the team working on the Yachay project commanded by Ramiro Moncayo. Finally, on March 2013 Yachay as a project became autonomous with the formal creation of Yachay EP⁵², the public enterprise that would have its own

⁵¹ On December 5, 2011, SENPLADES transferred the obligations, rights, attributions, functions, responsibilities, financial resources, information and other documents of the City of Knowledge Project to SENESCYT.

⁵² Yachay EP was created the 13th of March of 2013, through an Executive Decreed, No. 1457.

budget, operative structure and that would be responsible for the implementation of the project. With this change, the leadership in the project also changed as Ramiro Moncayo who had been in charge of the project since its reconfiguration from a technical University to a University City was not selected as Yachay EP's general manager, in his place the aforementioned Hector Rodríguez a young public servant, a member of Alianza País (Correa's political party) and a close ally of René Ramírez, was selected by the government higher authorities as the public enterprise's general manager. In the last section of this chapter, I will analyse this decision and the significance it had in the dynamics of the project. Before that, I will explore the material implementation of the project in Urcuquí, the decisions that were taken during this moment in the project's life, and explore what my focus on temporalities and infrastructures can help us analyse in this phase.

Accordingly, this chapter focuses on the temporalities intersecting in the implementation of the project, mainly on the infrastructural dynamics involved in the process of selecting the site for Yachay, dealing with the existent infrastructures, using expectations to decide on present uses for the land based on the future, and how all of this related to the histories of the place and of its peoples. In the first section, I start by recounting how the government selected Urcuquí as the site for Yachay, what criteria were taken into account for this decision, and I will describe how a historical sensibility is useful to understand these dynamics specially taking into account problems of land distribution and land use in the region. Then, the next section will describe and analyse the repair processes conducted in the old Hacienda buildings that would become the basic physical infrastructures within which both Yachay EP and YachayTech would function in the near future. In this section, drawing on the literature developed in the last decade or so around the roles of repair in sociotechnical dynamics (Jérôme Denis, Mongili, & Pontille, 2016; Jerome Denis & Pontille, 2011; Philippe Sormani, Strebel, & Bovet, 2016) I will pay attention to what these repair processes meant for the actors involved, how the work of repair intersected with processes of decay-breakdown as well as the materialization of expectations, and how these practices related to the site's history. Across the

chapter, I try to highlight the importance of analysing the old, the already existent, the long duration trajectories intersecting with those elements mobilized as the new and novel, the innovative. Finally, the chapter concludes with general reflections and setting the scene for the next one.

In line with the overall argument of this thesis, by analysing future oriented practices situated both in a specific case, a specific dynamic moment of Ecuador and in tandem with some of the historical dimensions involved, I aim to understand the multiple temporalities at stake, focusing on expectations, and analyse how these intersect with infrastructural dynamics. In this sense, my argument differentiates from other literature on science parks and planned cities that focus on the circulation of international urban models as a sign of a new technological age, and the critical analysis of the chiasm between the promised high-tech futures and the outcomes actually achieved so far (Castells, 2014; Chavez & Gaybor, 2018; Massey & Wield, 1992). Instead, I focus on analysing the complicated interface between the different futures at stake, how future orientations are linked to the particular pasts, both through the site's history, as well as through that of the multiple actors involved, and highlighting how dynamics of repair and reconfiguration more generally (Merz & Sormani, 2016), rather than just building-innovating from a blank slate, were fundamental in this moment in the trajectory of Yachay.

4.2. The first stage of the master plan: implementing the basic infrastructures

During the last twenty years, technocities and technoparks have circulated the globe as promising models of economic development tied to technological innovation for both developed and developing nations (AL-Mubarak & Busler, 2012; Massey & Wield, 1992). Understood as composite spaces that stimulate innovation, they connect public, private and academic actors in specific compacted geographic areas

that have been at least partially designed for this purpose. The two have become an important component of the implementation of regional innovation systems, biotech clusters and fast-paced approaches for “catching up” economies (Bogliacino, Perani, Pianta, & Supino, 2009; Rosiello & Papaioannou, 2009). These models have been critiqued when promoted as universal models potentially transplantable to different settings without minding specific historical trajectories (Mastroeni & Rosiello, 2013; Radosevic & Myrzakhmet, 2009). In this sense, it is important to analyse how in Yachay these internationally-travelling models were shaped by the country’s and the site’s region specific histories; as well as they were also shaped the different actors that were part of the project voluntarily or not, and by the authorities who had the power to shape it through public policy and direct political influence. It is important to understand both the historical trajectories at stake and the significance attributed in political and economic terms to such projects.

In this respect, Yachay’s designers have described it as an ambitious large-scale innovation project, based on the triple helix model but trying to push the model forward to include other elements such as community and sustainability. It was expected to do so by promoting innovation through the interaction of a technopark, a planned city and several technoscience research clusters mainly based on public research institutions. In short, the central goal of the project was to create a whole city designed to inspire academic research, promote innovation and stimulate the production of high tech products (Yachay, 2012). As mentioned in Chapter 3, by achieving that goal Yachay was expected to become the motor for the “change of productive matrix” of Ecuador; a rapid transition from an economy cyclically dependent on the extraction and exportation of raw commodities to a knowledge-based economy that could finally break this cycle. It was within this framework that ex-president Rafael Correa, as mentioned in previous chapters, described Yachay as “the most important project for Ecuador in the last 100 years” (Yachay, 2013a), and public authorities repeatedly referred to it in public events as the bedrock of Ecuador’s future economy. For instance Ricardo Patiño⁵³, a politician and diplomatic

⁵³ https://es.wikipedia.org/wiki/Ricardo_Pati%C3%B1o (last accessed 12-02-2020)

who was a close ally to Correa across all of his time in office and that at the time was Chancellor, described Yachay as follows during a visit to Korea: *“The Yachay project is of great importance for President Rafael Correa, because it is the base, it is the seed to ensure sustainable development in the future of the country”*⁵⁴

Similarly, international attention was also drawn to the Project before the EP or the University were created. A video released on early November 2012⁵⁵ by the name “Yachay in Ecuador”, narrated in English, described the vision of the project both showing designed images of how it would look in the future as well as highlighting Yachay as being part of Ecuador’s long connection with biodiversity and research through the connection between Charles Darwin’s evolution theory and the Galapagos islands. In the video Yachay is described as

This project is Yachay city of knowledge, Yachay is a kichwa word, which means to know or learn. This new city will become the first hub for knowledge in Latin America where research innovation and production will have space for development under a pioneering model of urban planning. Yachay invites domestic and foreign investment to be part of this academic scientific and industrial complex to join this entrepreneurial and innovative country dedicated to the pursuit of academic excellence. Yachay from Ecuador to the world.

Hence, public authorities expected Yachay not only to become a transcendental moment in the history of Ecuador, with the specific significance this had politically for the ruling party, but also for people to perceive in Yachay a threshold being crossed towards economic-modernisation, associated with both historically long-awaited retribution (the historical debt) and far-reaching future expectations that were

⁵⁴ <https://www.cancilleria.gob.ec/corea-un-gran-referente-para-fortalecer-la-ciudad-del-conocimiento-yachay/> (last accessed 12-02-2020)

⁵⁵ https://www.youtube.com/watch?v=rORdDE_pKso (last accessed 12-02-2020)

inseparable⁵⁶. These elements were present in the way ex-president Correa described to me what were Yachay main goals from his perspective:

The objective was to become producers of science and technology because the Neo-dependence is now around knowledge: the first world generates knowledge and we depend on that knowledge, and we usually get expensive and backward technology. However, another thing is also true: it is important not only to have science and technology, the human talent is vital, an innovative spirit, not to be afraid of failure, to have the cultural environment that allows you to innovate, change, apply science and technology. (Rafael Correa, personal communication, 2018)

In fact, this ambition that encompassed elements beyond doing science for the sake of science or developing technologies just for the sake of innovation, was perceived by other actors as one of the project's most attractive elements. Christian Cárdenas, a Chilean PhD Quantum Chemistry Lecturer, referred to this dimension of Yachay when he was interviewed on national television about what made him want to join the project:

I have read about this type of histories of projects that are born in experimental organisations as powerful as the one been implemented here. But, I have only read it in books, in history books. This was the opportunity to be part of the history of something that you can already see is going to be big, and you see it because you notice there is a search here for something different..." (Ecuavisa, 2013)

As we can see, actors in charge of Yachay were also attentive on promoting it as Ecuador's contribution to the "big History", through Yachay Ecuador could finally "make history" and not only import it as any other trade-in backward technology.

⁵⁶ As highlighted in the previous chapter this were two components present across the whole of the Correa administration during his time in office.

Scholars from the sociology of expectations have been prolific in describing how specific actors can turn expectations into fundamental resources in technological innovation processes from both public and private orientations-backgrounds. This is especially true on the matter of attracting resources, attention and achieving coordination between multiple actors not necessarily aligned previously or even working at the same scope: “Coordination can be achieved when expectations are common reference points for actors in different communities or different levels of technology development”(Bakker et al., 2011, p. 153). This was the case in Yachay as the project’s design itself implicated the gathering of actors coming from dissimilar arenas such as academia, private-business, public officials, undergraduate students from all over the country, and the people from the region of Urcuquí where the project was implemented who had very different expectations and lines of work. However, the coordination first achieved intra-governmentally had now to be expanded taking into account other actors with their own trajectories and interests, the futures negotiated and promises fulfilled. In this sense, one of my informants, who worked in the presidential office at the time, described how Yachay aimed to become a coordination-vision not only for actors in the project or within the government but for the nation as a whole: “The strategy was starting with a mobilizing illusion, which is one of the contexts that the president handled, which I loved. There are issues that really move the whole of society ...” (Public Officer X, personal communication 2017).

A component of this was that once the political backup was achieved and the project secured funding for at least its first planned stages, the expectations had to start being materialized into physical infrastructures during the implementation of the project. Regarding the implementation of the project, Yachay’s Master Plan states that the whole enterprise would be developed between 2010 and 2045, distributing the time-span into 4 phases. The first stage would last until 2019 and would focus on: building the university, constructing the residences for around 4500 students and 200 teachers, establishing the long term bases for the initial research clusters and importantly, implementing the basic infrastructure for services and mobility (Yachay,

2010). This initial stage would entail an investment of over a billion dollars⁵⁷(2012 – 2020) on the part of the government, and subsequent phases were expected to be sustained by attracting enough national and international private resources to complement the public investment (C. del C.- Yachay, 2014). This plan also divided Yachay into four different complementary sectors (see the figure below). First, the knowledge sector in which the University would be located together with residential buildings and the research clusters (including 19 relocated public research centres); the second was the productive sector in which national and international tech-oriented companies, technology transfer centres and business incubators could nest; the third sector was the biotech and agriculture sector which contains research and development centres for both topics including a potential pharmaceutical complex (Enfarma EP/Yachay, 2014). The last one is the tourism and entertainment sector (Yachay, 2012).

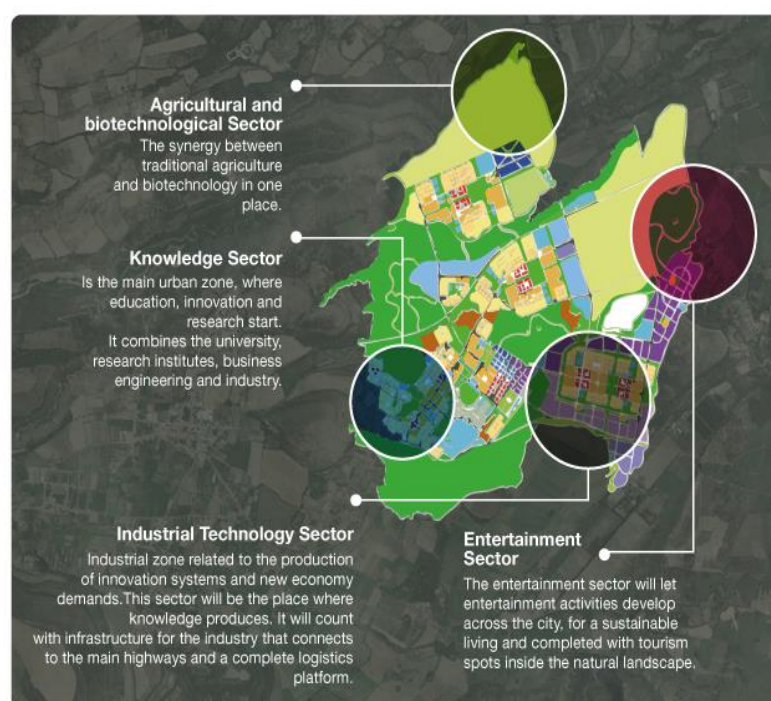


Figure 14. A map of Yachay's four sectors. Source (Yachay, 2012)

Having these elements in mind, the government had to make two decisions early on: where to locate the project, based on its future orientations and the government's

⁵⁷ USD 1.041.182.639,45

own established priorities, and which sector should have the head start for the physical implementation of the planned city. In the following paragraphs, I will describe how these two questions were answered in practice and how these decisions affected the site where Yachay would be implemented and the actors living in it⁵⁸. My focus will be the intersections between expectations and the infrastructural dynamics of repair-breakdown along with the temporalities at stake.

4.3. Selecting the site for the city of Knowledge: looking for the present through the eyes of the future

Even when Yachay was promoted as a city constructed from scratch, in fact as mentioned above it was referred to as the “first planned city in the history of Ecuador”, and the associated future novel components of the project were routinely highlighted and set at the forefront narratively, during its implementation Yachay’s designers had to deal with a variety of infrastructures, relations and actors that were already present and connected to intricate past historical trajectories. Yachay intervened in the trajectory of these sites, actors and relations, and by doing so it both reconfigured their trajectories and became a part to them. The complicated interaction between these two dimensions: the government’s future orientations, both short and long term, and its intersection with other actors’ past trajectories, and their own futures at stake, became apparent as soon as the implementation process started. In fact, from the beginning of its implementation the actors involved had to deal with the reconfiguration of the existing conditions and the multiple trajectories intersecting on the site where the city would be built both materially and symbolically. In this way, these actors and the project as a whole started to develop particular relations to the past, and to the futures materialised in their practices around infrastructures, I would argue in part, through how expectations were

⁵⁸ These actors were not homogenous, and here a historical sensibility is important, as differences in economic and political resources were significant as Yachay’s authorities expropriated lands from both small-scale owners and large-scale owners tapping into the dynamics of the associated Hacienda regime that was still present in the region. To explore these elements, the next section will briefly describe what the Hacienda regime was and how issues around land access, property and distribution are fundamental to both the region and Ecuador as a whole.

mobilized, negotiated and materialized at the site. The next section of this chapter will explore how practices of repair of the existing infrastructures reconfigured the space through particular ways of observing pasts and futures, while this section focuses on the selection of Urcuquí as the site for the project.

The process of reconfiguration happened in a material infrastructural level as the spaces where the project was going to be built were repaired to generate a new use for them, and many of the lands expropriated in the name of the future “public interest” that Yachay represented were sub-utilised having generated breakdown and decay of the previous settings in place, mainly agricultural production. One outstanding detail about Yachay at this point was its size: 4462 ha of land. These were expropriated by the government, starting in November 2011, from around 100 different owners. Large extensions of land were expropriated from big haciendas⁵⁹, but there were also other expropriations from small and medium-sized proprietors. Some spaces within this extension of land were repaired to generate new use for them; for instance, the buildings that would eventually become the University, as I will illustrate below.

According to official sources, the government considered several places when deciding the appropriate location to implement the project. Some of them were closer to main cities such as Quito or Cuenca, and others situated in areas that had been often overlooked historically like Santo Domingo, the fourth most populous city in Ecuador located in a tropical area at the west of Quito, and Urcuquí, where it was finally built. According to government documents, during working meetings seven specific criteria were established to select the location. These were: availability of land extensions with at least 2000 hectares; slope: flat zones preferably; connectivity: accessibility 0-1,5 hours to international airport; closeness to populated centres: areas near a populated centre of national importance; water: availability between 0-

⁵⁹ There is a brief explanation later in this chapter about what the Hacienda is and its historical significance in Ecuador.

25 mm/year; vulnerability: zones with low seismic and volcanic vulnerability; climate: temperate, humidity less than 80% (C. del C. Yachay, 2012).



Figure 15. A map of Ecuador showing some of the various possibilities preselected for the location of the project. Quito, Ecuador's capital, is identified by a white star-shaped symbol. Showing the various possibilities was intended to portray that the final decision was not arbitrary but rather contingent on defensible reasons previously decided by government officials (C. del C. Yachay, 2012, p. 7)

Urcuquí was selected among the different options as it fulfilled the proposed criteria and, according to government calculations, it would also have the lowest cost per hectare of land and would be situated in a space with historical significance⁶⁰. The government also mentioned indexes of land concentration and “socioeconomic vulnerability” as one of the crucial factors that tipped the balance towards Urcuquí. This was because the project was expected to benefit regions of the country which had been previously overlooked and relegated (SENPLADES, 2011a). We must take in account that Ecuador's main economic centres are located in Guayaquil (near the

⁶⁰ An illustrated video summarizing these reasons can be seen in Ciudad Yachay (<https://www.youtube.com/watch?v=GtEDoLgIGI8> last accessed 5-12-2019). Note that the video was published-uploaded in 2014 years after the selection had taken place, then in a way the objective of the video is to justify one of the aspects of the project's past, the selection of its site among other potential options, and of course communicate how this selection would shape its future connections and development.

Pacific coast) and Quito (in the central Andes region); Yachay is located three and a half hours away from Quito and 13 hours from Guayaquil. Its location was intentionally chosen to allow its growth in the future into a different economic centre for Ecuador (Yachay, 2010). When I asked about how this decision was taken, ex-president Correa described in the following way the process of selection for the site of Yachay, along with the internal negotiations happening at the same time between his own personal perspectives, that of other authorities of SENESCYT-Yachay and those of the Korean Team of IFEZ that was working on the development of the master plan for the project:

As a president, you make the decision. You have the political will, which came from me. However, obviously, the details were delegated to SENESCYT. In fact, to find Yachay's location, which by the way also created resistance, because people wanted it to be in Quito. If it had been in Quito, Yachay would not have all the problems it has. We hired the Korean advisory team, they researched for options, I wanted it to be between Santo Domingo and Quevedo because they only had one university, but for example, the weather was too hard for research, due to the equipment and all that, it is better to have a temperate climate. Cuenca was looked into too, but finally, due to logistics, communication and climate issues, the recommendation of the Korean team⁶¹ was Urcuquí. You make the decision as the president; the truth is that the place and the climate there are idyllic. People who go there fall in

⁶¹ The relationship of Ecuador with Korea is more extensive in time; it predates the beginning of Rafael Correa's government and the current cooperation scheme. The present one is based on several projects including granting scholarships for higher education, training of public officials, consultancies and investment in infrastructural projects in the industry, health and energy sectors. In the case of Yachay, it is not limited to IFEZ, who were part of the design of the Master Plan, as KOIKA, the Korean international cooperation organization, has invested in the Project through a donation of 5 million dollars for the development of "a house of innovation".⁶¹

love with Yachay. (Rafael Correa Delgado, personal communication, 2018).

In this passage, Correa highlights how Yachay's final location was one among many possibilities, one future among others that were negotiated taking into account both historical dimensions such as the presence or not of other Universities in the potential sites, as well as the will to decentralize Ecuador and break with the tendency to focus on Quito and Guayaquil as economic poles. Furthermore, in the passage is also apparent the complicated temporalities involved in the project, and more widely the intricate structure of time present in our societies (Luhmann, 1976). As Correa during our interview recalls how Quito was seen as a potential location for Yachay, and he reinterprets in the then present (2018) how taking that decision in the past (2011-2012) would have changed the project's trajectory and maybe avoided many of the problems it eventually had. Problems that were being perceived from the then present. In this sense, it becomes apparent how not only the future but the past also become storages for unrealized possibilities and how actors deal with this paradox.

Furthermore, the analysis of the process to select the site of the project enables us to see how the present itself was already seen through the eyes of the project; Urcuquí was seen through the future eyes of Yachay. For example, in presentations directed to governmental national authorities we can see images of buildings and wider photos of the valley of Urcuquí that have been edited to incorporate projections about the future in the form of repaired houses with modernized elements (see figure below) or the whole city's plans for the envisioned future combined with the landscape of the area (see figure below). In these images, which are in themselves materializations of expectations, the whole triad of past-present-future is observable. The first image emphasizes the tension between the three: old buildings that have suffered breakdown and visible decay are contrasted with an image of one of them as it was anticipated to become in the near future. The houses even stand against one another, making partially observable in the present, for the authorities witnessing the presentation, both past and future.



Figure 16. April 2012, an overlapping image of the ruined houses and the projected student residencies produced by the team behind the Yachay Project for presentations of advances and planning with the central government. (SENESCYT-Yachay Ciudad, 2012, p. 21)



Figure 17. In this 2012 image, sociotechnical imaginaries of Yachay in the future are fused with a panoramic picture of the Valley of Urququí. We can visualise a land “committed” to the future, a future which through this visualisation inhabits the present, or in this case the past, in a ghostly way against the backdrop of the Andes. (C. del C. Yachay, 2012b)

The selection, expropriation and use of the lands to build the project also tapped into a long colonial history shaping land property and its agricultural production in the country. Land concentration and associated inequalities in access to land and other resources, such as irrigation water, along with the lack of technological transfer to small-scale farmers, have been structural problems since colonial times. Urququí was not the exception. After the selection had taken place, the government stated that: *“The first planned city of the country will be built in Urququí, province of Imbabura, in an area of 4,270 hectares, an area of ideal climatic and topographic conditions for the operation of high level academic and scientific centres.”* (C. del C. Yachay, 2012, p. 9).

This pursuit of the “perfect” place for the production of knowledge intersects with the insights generated by the literature of STS on the configuration of new knowledge spaces (Merz & Sormani, 2016) and truth spots (T. F. Gieryn, 2006; Thomas F Gieryn, 2002). The insights within this scholarship regarding the importance of place in the pursuit of credibility and the reconfiguration of materials, actors, and narratives in the production of new knowledge spaces can be read in the case of Yachay throughout the materialization of expectations in the configuration of its infrastructure. The present itself was already seen through the eyes of the expected project; Urcuquí was seen through the future eyes of Yachay. In promotional images, sociotechnical imaginaries of Yachay in the future were fused with views of the Valley of Urcuquí; thus, visualizing a land “committed” to the future, a future that through these visualizations inhabits the present in a ghostly manner. As Doreen Massey argues, this is one of the reasons why studying the past of a place is fundamental in order to understand the temporal struggles which are triggered by the disruptions generated by the implementations of this kind of projects. Massey explains: *“The description, definition and identification of a place is thus always inevitably an intervention not only into geography but also, at least implicitly, into the (re)telling of the historical constitution of the present. It is another move in the continuing struggle over the delineation and characterisation of space–time.”* (Massey, 1995, p. 190)

In the next sections, two moments in which these elements intersected during the early implementation of Yachay will be analysed, highlighting the importance of history and the actualization of pasts and futures during these processes. First, section number 4.4 deals with the history of the site connected to the land, and how the process of expropriation of the land required for the future of the project resonated with long duration dynamics of both Urcuquí and Ecuador as a whole. Then, section 4.5 deals with the repair processes conducted over broken and decayed infrastructure of Hacienda buildings that would become foundational elements for Yachay into the future. In that section, I will briefly discuss STS approaches to repair practices in order to grasp the particularities of what the repair process of the existent infrastructures meant for the government and for other actors, their role on

sociotechnical dynamics and I will define how I think repair as an analytical category connects with expectations and the line of argument this thesis pursues.

4.4. The expropriation process: land concentration in the region of Urcuquí, its past and its futures

The focus of this chapter has been the importance of a historical sensibility towards places and its people for understanding innovation projects such as Yachay. I will be exploring this theme across the rest of this chapter through the trajectories of the places and the peoples with which Yachay intersected voluntarily and reluctantly. When talking about trajectories it is important to note that Yachay was approached as a top-down intervention focused on triggering generative linkages between private, communitarian, academic and public actors and institutions. This approach meant that at least in the early stages, the government would be making all the decisions while being in charge of the principal investments through public funds. Consequently, it would also be dealing with most of the risk involved. Nonetheless, this centralization of the role of the government was intended to change across time as private investment was attracted, and civil organizations got more involved in the development of the city. Although in theory the main actor was the government, from the beginning of the implementation process, other actors, such as the people living in the communities within the perimeter of intervention and people from Urcuquí, had to deal with the risks too.

Hence, the accomplishment of the government's strategy relied on a future that was designed in a very top-down manner, and as Yachay remained an intellectual initiative within the government they overlooked the interests and trajectories of actors who were not part of the government. However, as soon as that future started to be implemented in a specific site, the diverse trajectories of many actors that were already connected to the site (as hacendados, small land owners and people who worked on those lands), and many other that arrived there because of the implementation process itself (academics both national and international, students, the Korean IFEZ team of advisors) intersected with the trajectory that Yachay had experienced until that point. This intersection affected the interests, visions, histories

and social groups that would shape both the dynamics of Yachay and those of the Valley of Urcuquí and its peoples.

Following the selection of Urcuquí as the site for the project, the government made a declaration of public utility in December 2011 for the 4270 hectares, which consisted of 117 properties of very different sizes, which when in use were mainly dedicated to agriculture. Some of these properties had large extensions, some from haciendas and some smaller ones from other owners. According to public records, 13 families owned 72% of the total area of intervention, while there were 48 properties with less than 20 hectares. The biggest of all the properties was the Hacienda San José, at the time owned by the Salvador family, who had around 900 hectares (C. del C. Yachay, 2011, p. 11). These records mirror the land distribution indexes in the region, one of the most unequal in Ecuador as a whole⁶². The Hacienda San José had been tied to a long history of political and economic domination in the region, based on a hierarchical management of land, social life and labour, and remained as one of

⁶² The concentration of land in Ecuador and the Hacienda system have been one of the many trajectories shaping the country's present that come from its colonial past. Even after formal independence from the Spanish Crown was achieved during the 19th century, much of the administrative structure implemented during the Colonial period remained; the distribution of land and the institutions associated to the agrarian world are an example of this. In fact in 1964 when the first Agrarian Reform was passed in Ecuador (while the country was governed by a Military dictatorship) the then Minister of Production, José Corsino Cárdenas, said in this respect: "we destroyed the political institutions of the colony, but in the countryside, where the main sources of our economy are, we left the colonial agrarian institutions in force. This inconsistency ends today, 134 years after the Republic was established.") (<https://www.eluniverso.com/noticias/2016/07/30/nota/5716593/12-julio-1964>) (last accessed 12-02-2020).

Another one in 1973 would follow the 1964 agrarian reform, they both had significant impact, but inequality in land distribution and access to productive land continues to be one of Ecuador's socioeconomic biggest problems until nowadays. At present centralization in hands of Hacendados has been replaced by large conglomerates dedicated to mass agricultural production. Land distribution continues to be one of the most important political struggle focal points, both in terms of social movements as well as in the governmental arena where Hacendados used to have tremendous power and where decisions taken at governmental level are influenced by private groups from the agrarian industry (Anahi Macaroff, 2018b; Anahí Macaroff, 2019; Quevedo, 2013). By intervening in the trajectory of Urcuquí and the haciendas, Yachay became part of this trajectories, had to deal with the complicated and multiple pasts immersed in the colonial and republican period, it became part of an unfinished history not only as an instantiation of a national struggle, but rather as a moment in the ongoing process of shaping at multiple levels-durations the practices and institutions around land-distribution in Ecuador. Similarly, Yachay's authorities decided to which aspects of the past of that place and its people to recognize, deal/with, actualize, acknowledge, break-with and connect with, through their plans and expectations about the future.

the last Haciendas to be kept as such in the whole of Ecuador (see image below). The expropriation processes triggered several problems with the communities that will be explored in the next section of the chapter. Some of them are interconnected and can be described as follows: first, small proprietors did not want to sell their lands to the government, so they had to organise themselves as communities to obtain legal protection. Second, the expropriation processes left several inhabitants unemployed as they used to work for the haciendas. Thirdly, the types of works available did not necessarily match their current set of skills as the main demand was for construction workers, and most people in the region have farming backgrounds. Fourth, the fact that the government expropriated all the 4462 hectares at once generated strong resistance, and due to Yachay's, long-term projection much of this land would remain unused and abandoned until the future claimed it.

Before going into details about these conflicts, I will try to synthesize in the next paragraphs how deep these problems are for Ecuador and for the region, and what kind of durations Yachay trajectory was intersecting with, and coupling-with, into the future. Especially the role haciendas have had in Ecuador's history and the trajectories of the actors tied to them. The intention is to both extend the temporal lenses of the research and by doing so capture some of the multiple durations that constitute the complexity of Yachay.



Figure 18. The photograph from early 20th century (1910-1920) shows the main patio and the patio of the San José Hacienda. A strict hierarchical social structure operated within the Hacienda reflected on the spatial ordering of the people in the picture: authorities ride horses on the front, then the indigenous people line up behind them, in the back then stand in line the afro-Ecuadorians and the women. Source: (INPC-Ministerio de Cultura y Patrimonio, n.d.)

If we move away a little in time, we can appreciate that the area that today composes Ecuador experienced two different processes of Conquest, one after the other. First, a Conquest starting in 1440-1450 by the Incas from the area of present-day Peru who gained control, intermittently and with contrasts and continuous struggles of rebellion, over a significant section of the central area of the Andean highlands, including Imbabura (where Yachay is located), and almost on to the border with Colombia⁶³. The Incan control over the coast of what is nowadays Ecuador was lower and was limited somewhat to commercial exchanges; in the Amazon region, there seems to have been no effective Inca conquest (Bray & Echeverría, 2014, 2018; Caillavet, 1996; Ogburn, 2018). Subsequently, the second Conquest was the Spanish conquest and invasion initiated around 1534 that would result in the implementation of the Colony system, and the compaction into one formal territory of a great variety of ethnolinguistically diverse populations. The Colony's rupture in formal terms happened during the independence-oriented struggles initiated in

⁶³ In fact, Tamara Bray and José Echeverría place the Inca- Caranqui site as the northernmost of South America where the fine stone carving art characteristic of the Incas has been found (Bray & Echeverría, 2014)

1809⁶⁴ that would culminate in 1830 with the formation of the Republic of Ecuador after the fragmentation of the Great Colombia.

To date, few studies have been able to define precisely the global impact of the colonial period for contemporary Ecuador and particularly for its governmental institutions, the formation of power groups and its economic structure. Yet there is no doubt about the depth of the traumatic impact that these processes had in the peoples of the territories composing Ecuador, especially in the indigenous and Afro communities, nor the influence to present day of the impact at the demographic level (Crosby, 2015; Newson, 1995; Ubelaker, 1994; Ubelaker & Newson, 2002); at the social level in relation to, for example, the racial hierarchy of society and the particularities of public and private institutional formations (Aguirre, 2018; Bretón, 2012; Cueva, 1972, 1977; Mahoney, 2003; Mignolo & Walsh, 2018). Also, the environmental impact of the established forms of production (Moore, 2010; Nriagu, 1994); and at the economic level in terms of the specialization in the production of commodities, the low complexity that characterizes the economy, the social distribution of work, fiscal dynamics and the evolution of the systems of internal and regional trade, along with Ecuador's link to the global economy (B. Armendáriz & Larraín, 2017; Feijoo, 1991; Lane, 2004).

All this is product of the atrocious process of conquest and the subsequent establishment of colonial forms of organization of social life and work such as the *obrajes*, *encomienda*, *mita*, slavery and *concertaje* (Germán Colmenares, 1992; Grijalva, 2018; Andrés Guerrero, 1991; Kennedy Troya & Fauria i Roma, 1987; Tardieu, 2012; Zambrano, 2011). These were part of the reconfiguration of the organizations and social hierarchies that already existed, including the expropriation and distribution of the land that belonged to different communities and the later concentration of that land in the shape of *Haciendas*, plantations, *estancias*, and the associated extraction of wealth in a systematic manner through forced labour, mining, tributes and taxes (Guerrero, 1975; Najas, 1994). Forms to which there was

⁶⁴ Quito, Ecuador's capital, is known as "Quito Luz de América" as it was in Quito where the first "gritos de independencia" (pights for independence) in South America were pronounced and fought for.

resistance and rebellion, and of course brutal repression (see chapter 6 in Lavallé, 1997; Moreno Yáñez, 2014, 2017).

The Hacienda, understood as the large territorial properties⁶⁵ of mostly agricultural nature, but with textile activities too, devoted to both its own reproduction and the reproduction of the colonial system, were mainly located in the inter-Andean corridor (Cossin, 2019). The Haciendas would survive the formal end of the colonial system, and the landowners associated to them would become part of the political and economic elites of the country based on their monopoly on the land and their domination over populations (Báez, Cueva, & Moreano, 1995; Feijoo, 2015; Andres Guerrero, 1975).

Furthermore, due to the fragmentation of the political and fiscal system of the Spanish Empire and the constant need to ensure the subordination of the local elites (a history with constant tensions and conflicts), these elites were already constituted and enjoyed, even before the independence, the ability to negotiate, influence and direct fiscal, subsidy and expenditure policy, in addition to shaping political and administrative decisions at the local level within Latin America and Ecuador under Spanish rule (Feijoo, 2015; Grafe, 2008; Grafe & Irigoin, 2006; see chapters 5 and 7 in Lavallé, 1997). Hence, since colonial times and after independence, and already into the twentieth century, land ownership became both in the Sierra and the Coast of Ecuador a significant source of economic and political power both locally and nationally, and the elites organized and strengthened around these lands, especially around the large Haciendas in the Andean highlands, and around the cocoa, rice and banana plantations on the Coast (Chiriboga, 1980; Crawford de Roberts, 1980; Espinoza, 2014; for the actuality of these processes see Anahi Macaroff, 2018b).

Therefore, the centralization of land and income that is found to date in Ecuador generating inequality at all levels (Daza, 2017; Larrea & Greene, 2018; Martínez, 2014) resonates with the interaction between structural factors from the Colonial era

⁶⁵ To have an idea of the size of these properties, the Hacienda Guachalá located near Imbabura was covered an área of 1000 km² at its peak, around 100,000 ha (Cossin, 2019). This is around 4 times the size of Edinburgh.

and after independence, and of contingent factors that have marked both Ecuador's history and the that of its relationship with the global economy during this time. Haciendas were fundamental in this sense, for example in the conformation of local elites, the susceptibility of the state to its influence, the systematic exclusion of indigenous and Afro from the spheres of power, and the nation's economic specialization. Ecuador is characterized as being one of the most unequal countries in Latin America, which is also the region with the greatest inequality in the world⁶⁶. In Ecuador, this is visible in the high concentration of income and land, a problem that two partial agrarian reforms failed to unlock (Larrea & Greene, 2018; Maldonado L., 1980; Martínez, 2014).

Within this context, the expropriation process that followed the declaration of public utility in Yachay was very problematic. Agreements were achieved between the government and some of the landowners, but there were also owners who refused to accept the payment and decided to sue the government. One of my informants who was involved in the expropriation process from an executive role would describe his experience during that time and the tensions generated, in the following way:

“I was in charge of limiting the expropriation area, that is, establishing the limits for the implementation of the project and that was also done with advice from the Korean team and us, but we translated it into the field. I became the most unpopular character among the traditional agrarian world of the province of Imbabura. The hacendados said, “That’s not what my land is worth.” So we entered a judicial process, which meant a substantial erosion in the implementation of the initiative. (Public Authority 4, personal communication, 2017).

⁶⁶ <https://blogs.oxfam.org/en/blogs/17-12-18-latin-america-remains-most-unequal-region-world> (last accessed 12-02-2020)

Consequently, the management of the land became one of the biggest issues at stake⁶⁷. Adding to the tensions, a vast amount of the expropriated lands was not planned to be used immediately. The project was expected to grow gradually over time but the expropriations were not done gradually. Public authorities decided to expropriate all the extension of the land from the beginning in order to avoid possible future speculation. As a result, a large amount of the land was not put to use, remaining inactive, waiting for the promised future to come. Unsurprisingly, for the land once used for agriculture, this meant that significant extensions have started to degrade and suffer erosion; others, which were already not in use, remained neglected in the short term while the legal litigations were developing. In a way, that land was promised for a prosperous future, but the inactivity generated by this anticipation produced and reinforced processes of decay. I was able to witness this first hand during fieldwork.⁶⁸

The expropriation process also generated tension with the small communities living in the zone. The area of Urcuquí and the haciendas that were expropriated by Yachay were marked by dynamics of control and struggle for land and water. This is an issue present around Ecuador and continues to be one of the sources of inequality nationwide as Ecuador still has a very high index of inequality in the distribution of land (Larrea & Greene, 2018; Anahi Macaroff, 2018a; Martínez, 2014). The Urcuquí zone had a high centralization that can be followed historically to the colonial time with the distribution of the territories by the Spanish crown, San José Hacienda was part of this process and a symbol of both its persistency and its slow decomposition (Alfaro-Reyes, 2017; Frederic Apollin, 2002; Feijoo, 1991).

⁶⁷ Interestingly one of the aspects of the Korean experience of development which was highly valued within the government that was least discussed was the fundamental role that a wide land reform conducted across the country had in Korea after the war, and how agrarian conflicts shaped the development of capitalism there historically (Shin, 1998). Moreover, it was overlooked how a land reform much more thorough than the ones conducted in Ecuador influenced both the later avenues for economic diversification and development of the country, as well as the role this had in debilitating the traditional-aristocratic classes and cementing the associated consolidation of the enormous power the state had over the dynamics of the Korean economy, and the entire society more generally (H.-J. Chang, 1993; H. J. Chang, Park, & Yoo, 1998; Kyung-Sup, 1999).

⁶⁸ <https://www.youtube.com/watch?v=jzsa-JdhmDo> (last accessed 12-02-2020)

The entry of Yachay occurs in a moment of transition during the rupture or decay of what would be the hacienda form of production in the central region of Ecuador (Bretón, 2012; Feijoo, 1991; Martínez, 2014). For example, the Hacienda San José was sold during the 1970s, after the land reforms that triggered the breakdown of the Hacienda system, to the Salvador family who let part of the existing infrastructure of the hacienda to fall into disrepair and eventually decay. This was the case for many of the workers' huts and some of the infrastructure of the sugar mill that operated there. The communities in these territories had a historic struggle with the hacendados, the owners of the haciendas, regarding land and irrigation water management that had expanded for centuries (Frederic Apollin, 2002; Frederic Apollin & Nunez, Pablo, Ruf, 1998; Feijoo, 1991). In fact, some of the interviewees mentioned that before the entry of Yachay, several groups in the communities were already organizing collectively to buy land from the big landowners, and put the sections of it that were decaying into the service of families and small-scale producers. This illustrates some of the other futures at stake for the inhabitants of those lands.

Yachay arrived fast, and when the decision was taken to expropriate at once all the territory that would be used in the future, a significant part of the more than 4000 ha would face a paradoxical situation: promised for a bright sociotechnical future but left to the hands of erosion. Of course, much of that land would not be used for years, and even when it was committed to a promised future in the present, it would look abandoned, and not cared for nor maintained. This paradox was intensified by Yachay's long-term vision, which demanded space in the present for it to develop increasingly over time, but the decision to expropriate all at once, was connected to shorter-term concerns. The government planned to avoid speculation concerning the future prices of the land, as well as harder legal struggles, which is why they decided to buy all the required land immediately. Thus, Yachay had a promised land to a medium-term future, at least 30–40 years into the future, but whose process of expropriation was swift and carried out in a short period. The government authorities anticipated that the ongoing expectations would push up the prices of the land

generating the temptation of owners to speculate or build sprawls outside of the Yachay intervention area. This decision resonated with both the national and local tendency in the history of Urcuquí and San José, towards the accumulation of land and its subsequent underutilization. When asked about this topic, ex-president Correa described the following:

One of the errors that people criticise, which could have been an error, but a minor error, is that from the beginning, we expropriated almost 5000 hectares, knowing that it would take years to use them all. However, there was a risk that if we did not expropriate all, the space could have been urbanized.

(Rafael Correa Delgado, personal communication, 2018)

This initial speed marked an intense break, both in generative and destructive ways, with the rhythms and ways of life of people in these areas, as well as with their expectations regarding their own lives and their children's. The break generated with the existent socioeconomic regimes, and the potential opportunities for the children in the projected city, signalled this change in expectations. For example, to protect their lands from public expropriation, several groups of families who were settled in small neighbourhoods within the intervention site organized and legalized their properties as communities (La Hora, 2012). As communities, they were protected by Ecuador's constitution and their lands could not be declared of public utility if they considered it otherwise. This changed their legal status and reshaped their own organization internally, their sources of income would also have to be adapted similarly, and this was particularly difficult for many of them. Eventually, some of them would organize in cooperatives that would provide services for Yachay EP and YachayTech, others would have to migrate to look for jobs elsewhere and others had to readapt their skills as farmers into those required for the project at that moment in time: mainly construction and maintenance work.

Nonetheless, the unrest would not end up there as the problems related to the accumulation and underuse of the land on the part of the project would continue

generating tensions with the population years into the future. Both its temporal reach and its intent to track the multiple temporalities shaping and being shaped in situations that are “comprised of differently paced constituents” characterize the BOAP approach (Hyysalo et al., 2018). Following these premises, I have tried to briefly describe the extended duration of the struggles around land as a way of highlighting how they were 1) part of a much deeper conflict around land issues in Ecuador, with a duration at least traceable to the early colonial period when the then Spanish Crown invaded the territories and violently reorganized their distribution along with establishing systems of domination and exploitation of the subdued peoples, and 2) a constant matter of concern for Yachay itself and for the actors involved in Yachay into the future. Yachay was both shaped by this long-duration trajectory as well as becoming part of this trajectory, and shaping it into the future.

For example, during early 2013 Yachay’s authorities conducted a number of “socializations” of the project with the communities living in the perimeter of intervention. These socializations were very one sided and most of the people I interviewed who participated mentioned that they were never asked about their thoughts on the project, much less about the futures they would be interest in pursuing in it. In fact, based on this experience and the need to work alongside the communities that were now part of Yachay, after its official creation as an institution in 2013 Yachay EP was divided into multiple departments, one of them was the department of community relations.

This department would deal with the multiple fronts through which the project was connected and interfering with the, until then, daily lives and expectations of the peoples of those communities, one of those fronts was the distribution of land. In a report from Yachay EP’s department of community relations of 2015, they insist that the problems generated by the expropriation process were still some of the biggest factors generating resistance against the project from the communities especially for those directly affected by the expropriations. In these segments, included in the conclusions of the 2015 Area Report of the Community Relations Department they refer to the situation of those inhabitants who worked or had rented lands from the

San José Hacienda and were currently unemployed or urgently needed support and attention from the EP. The section provides evidence that the Community Relations Direction insisted on the problems at the local level generated by the intervention of Yachay, in particular to the problem of the land among the inhabitants and their abandonment” and describes the situation as follows:

The support provided to small farmers who have crops in the San José plots through the facilitation provided in the signing of the letters of intent and the collection of geo-referenced information is an important example of support for the community and especially for those who have a complicated social-economic situation and are directly affected by the expropriation and abuse processes of former owners. In the case of the San José plots, the Managements should be requested to establish permanent coordination spaces in the territory, especially on sensitive issues in order to avoid complicating simple situations. And that with a better internal communication and coordination, a more effective management would be achieved. (Informe Anual área de gestión comunitaria 2015. Yachay EP, 2015).

Some of the hacendados had already abused many of these people as they worked in the haciendas many times with very poor labour conditions, low payments and few or none possibilities to improve their quality of life under that regime. In addition, they were looking for opportunities to own lands on which they could grow crops with which they could sustain their families and somehow be a part of the futures promised by the project. The direction of community relations would go on to suggest that the social tension generated by this situation and the general perception of abandonment that surrounded many of the underused lands needed to be addressed and they suggested a possible solution:

It is important to maintain a certain level of presence in the territory to neutralize the perception of abandoned land....Take advantage of these spaces to consolidate the institutional image as a company committed to cultural, social life, etc. of the province, the canton and its parishes....The institution must design a plan that allows to respond to the demand for land and the need to sow the population that became unemployed after the expropriations, in this way it would avoid that there is increasing social pressure on the lands and could generate more employment and improve the income and quality of life of the communities. (Informe Anual área de gestión comunitaria 2015. Yachay EP, 2015).

For several reasons, these problems related to the land continued at least until 2018. Yachay EP's new administration would start implementing land-renting schemes to make available some of the unused extensions that according to some calculations were around 1500 hectares⁶⁹. Similarly, other land extensions remained, at least until December 2017, under legal dispute; this is the case of the land that was devoted to the implementation of the potable water treatment plants for the whole city⁷⁰. A constant tension emerged between the expectations of a future in which both the communities and Urcuquí would be part of a new economic pole for Ecuador based on knowledge and innovation and the present dynamics of the effects generated by the rupture with the previous forms of economic organisation. This tension between a promised future and an uncertain present was visible in the land itself as it incorporated both the anticipation on the part of the government of possible future speculation that could increase costs and the present-generated problems of abandonment and decay that I have detailed above.

⁶⁹ <https://lahora.com.ec/imbabura/noticia/1102117058/en-yachay-le-daran-uso-a-terrenos-improductivos-> (last accessed 12-02-2020)

⁷⁰ <http://www.yachay.gob.ec/empresas/wp-content/uploads/downloads/2018/12/27-03-2018-Informe-Rendicion-de-Cuentas-ilovepdf-compressed.pdf> (pag.21) (last accessed 12-02-2020)

In the context of the selection of the location for Yachay, René Ramírez, the national secretary of SENESCYT at the time and one of the “mentors” of Yachay, said that Urcuquí was the perfect place because it enjoyed “an eternal spring”(Flores, 2014). He also argued that even if Yachay generated its uncertainties while opening into the future, including those uncertainties related to the complicated land management, these uncertainties should be looked as opportunities. These uncertainties could be seen as a chance for Ecuadorians to agree a “social pact”, living political disputes behind to push together towards a common future. In his words: “To begin with, science and the university are apolitical, the real challenge for us is, as Ecuadorians, to make a social pact, an intergenerational pact; to keep Yachay as a national project, as part of the state structure... and do not let it be stopped for political reasons”(Ecuavisa, 2013). The future the Government promised and that it wanted to build relied on achieving this pact and a common alignment towards their vision for Yachay, but the communities affected by Yachay had their own agencies and visions, as well as the hacendados, and they did not want to align with the government’s vision even when the government clearly had the upper-hand in the dispute. The intergenerational component of this whole process will become more apparent in the next sections.

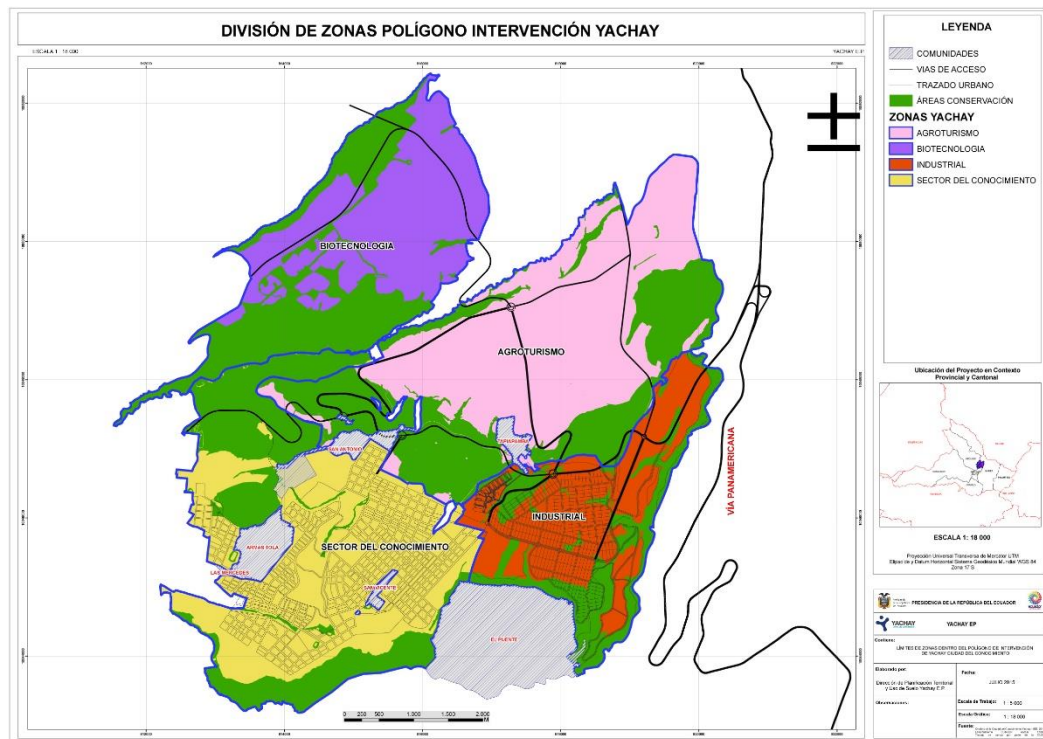


Figure 19. A digital map of Yachay's perimeter or intervention, the grey zones within the perimeter are the communities that became part of the population of the project after they opted not to sell their lands and organized as communities legally. Source:

https://upload.wikimedia.org/wikipedia/commons/c/c9/Mapa_Yachay.jpg

4.5. The paradoxical dynamics of infrastructures: breaking with the past as repairing

As the literature on infrastructures continues to develop in STS (Edwards, Jackson, Bowker, & Knobel, 2007; Star, 1999; Star & Ruhleder, 1996), there have been explorations not only about how sociomaterial order is achieved or constituted in the first place, but also about how it is sustained across time during demanding situations through practices of maintenance and repair (J. Barnes, 2017; Jérôme Denis & Pontille, 2015; Graham & Thrift, 2007). Furthermore, infrastructural fails and breakdown have also been explored in a variety of settings and scholars have highlighted through them the precariousness and contingency of infrastructures (Schwenkel, 2015; P. Sormani et al., 2019). This unavoidable vulnerability of artefacts and infrastructures points to the practice of repairing as a central conceptual and observational node for understanding the dynamics of sociotechnical artefacts and

projects in practice: “we thus assert that repairing is itself an important conceptual extension to consider in understanding the situated interaction between the social and the material” (Jarzabkowski & Pinch, 2013, p. 586). Furthermore, breakdown was traditionally perceived as the only moment when infrastructures became visible, otherwise left to the background both in social practices as in analysis, scholars have underlined “the observation that “infrastructures” and “nature” both often operate as unseen backgrounds for the study of social relations and practices” (Jensen, Morita, & Harvey, 2017, p. 2).

However, Yachay represents an interesting entrance point to the topic at an analytical level because here infrastructures are visible precisely because they have not been yet implemented, so breakdown is not the only moment in which they become visible. In addition, repair processes here are a component of the infrastructuring of the project itself rather than a reaction to a breakdown in its operations, in other words repair processes in this case have a foundational role rather than being a response oriented to restore a lost order. This approach ties well with the understanding of infrastructures as asynchronic timescapes that draws on the work of Barbara Adam around timescapes and how these mediate asynchronic temporalities both between human and not human entities at different scales, as well as providing contingent stability to socio-temporal understandings and practices (Adam, 1999, 2000; Adam & Groves, 2007), as the author explains:

“Understanding that every infrastructure is an asynchronic timescape indexes the inherent fragility of a connectivity that can only emerge when these multiple temporal relationships are, more or less successfully, synchronized in the work of construction, maintenance and mundane utilization. The omnipresent processes of ruination and decay reveal the challenge of this task – a challenge that results from the fact that each infrastructure is not only itself a bundle of relationships but also connects to a plethora of other relationships on which it depends and which it enables, transforms or severs (Campbell 2012; Joniak-Lüthi, forthcoming)” (Joniak-lüthi, 2017, p. 7)

I propose that in this respect, expectations are a stimulating entrance point to study situated practices of repair, as in the case of Yachay. This is the case, precisely because repair deals with the past and the future, mediates between the past state of an artefact or sociotechnical system in respect to a desired future, or at least one that works. This could be short term or long term, be it repairing an artefact that was functioning adequately a couple of moments ago and is required for the development of a social practice in the immediate future; or, as in the case of Yachay, a repair oriented towards restoring buildings that were functional decades ago before being abandoned and subjected to decay, and which use will be unravelling alongside the long-term plans of Yachay as a project. Through the repair process, the temporal modulatory aspect of expectations I am trying to highlight is visible and materialized, as both pasts and futures play a fundamental role in it. This is especially true in the process of deciding how these, pasts and futures, will interact in the repair process going on in the present, and if the scripts once embedded into the artefacts want to be replicated in the future or if the repair process, commonly preceded by instances of breakdown, aims to give the objects that are being repaired a new role within a different sociotechnical practice and its projection towards the future. It is this intersection between expectations and infrastructural dynamics what I want to highlight. In the next paragraphs, I will exemplify this analysis by zooming in into a moment in time of the infrastructuring of Yachay.

After the declaration of public utility, the authorities of the project who at the time were still working in SENESCYT decided that the San José Hacienda, along with the San Eloy Hacienda⁷¹ that was located further north in the intervention area, were going to undergo a process of repair, restoration and would have their spaces reconfigured in order to serve in the near future as the basic infrastructure for the University and the public enterprise. The University was going to be constructed at the heart of Yachay. The San José Hacienda has a long history and is tied to the colonial history of the haciendas and the aristocratic power in the central region of Ecuador that I explained in the previous section (F Apollin, 2002; Feijoo, 1991). The

⁷¹ This chapter focuses on the processes conducted in the San José Hacienda.

process involved the repair and restoration of 49 buildings, ranging from a sugar mill to small houses in which the hacienda workers used to live when the hacienda was operating; these were in a state of substantial deterioration and could be seen as a symbol of the low quality of life most of the workers were subjected to during centuries, as well as the state of decay of the hacienda regime itself.



Figure 20. The houses of the workers before and after the repair process. Source: (INPC, 2012; C. del C. Yachay, 2012a)

In the view of the authorities involved in this process, the restoration meant, on the one hand, a material actualization, through the repair of many buildings and home settings, that in many cases were in severe disrepair and others in thorough decay, as we can see in the pictures above. But also, on the other hand, it meant a reconfiguration of what that repaired space meant historically and for the future. A once privately owned and centralized land, a symbol of the economic and social system of the Hacienda, became the foundation for a public project that was expected to transform the economic matrix of the country. From private-oriented manual labour to public-oriented intellectual work, a sign in itself of the promised future transformation. In words of one of the authorities in charge:

We started to repair and potentiate what you can see now, the sugar mill as the classrooms and laboratories of YachayTech, the House of the

Hacienda as the administrative area of YachayTech, the stables and the dormitories of the workers, now converted into the dormitories of the students, and classrooms. So, we modified it symbolically too, that was very important because what was once a symbol of the aristocratic opulence of Ecuador in the past centuries, we turned into a project of a public university. (Senescyt authority 1, 2017)



Figure 21. The “Casa de Hacienda” during the San José Hacienda regime, early 20th century while the Hacienda was still operating. The building on the right hand side is the Chapel and on the one on the left is the Hacienda house where the family of the hacendados lived. Source: (INPC, 2015, pp. 14–15)



Figure 22. The administrative offices of YachayTech after the reconfiguration process and already in use. The building on the left is now used for the administrative offices of the University including the office of the Rector. The Chapel is now an events and conference salon. Source: (Tech, 2017)

The process of repair and restoration was perceived as a breaking point for the social and economic dynamics coming to an end in Yachay, and, at the same time, the starting point of a new space reconfigured for public education, knowledge sharing, and innovation. This reconfiguration would be at the very heart of the city, marking a symbol of a repaired past as the centre of a future assemblage. The past interlaced materially with the future, in this case, the repair of the existing infrastructure and the new function it would have, were established as symbols of that same past coming to an end, and a way of connecting Yachay as a technological innovation with the technological power and significance which the sugar mill and the complex (see figure below) as a whole had had in the past. The Jijón family who sold it to the Salvador family had owned before the San José Hacienda. San José Hacienda was “modernized” during the twentieth century by Jacinto Jijón y Caamaño by implementing a semi-industrial complex to process cane sugar in a process that authors have tied to the adaptation of the hacienda regime to a more capitalist-oriented mode of production (Bretón, 2012; Feijoo, 1991; Andrés Guerrero, 1984). He was known as “El Conde Jijón y Caamaño” and he is a figure of a broad historical significance for the country. His family owned different properties in the region across centuries (Gérman Colmenares, 1992), and they were a powerhouse in both political and economic

spheres. Preserving the buildings was a way of acknowledging this power and reconfiguring it rather than erasing its traces:

We started with the old San José sugar mill and said, “this is going to be the axis of the territorial development of the future City of Knowledge.” And the installed infrastructure started from the fact that the Count Jijón y Caamaño built all of that complex and developed the infrastructure of the first sugar mill in the northern part of the country. (Senescyt authority 1, 2017)

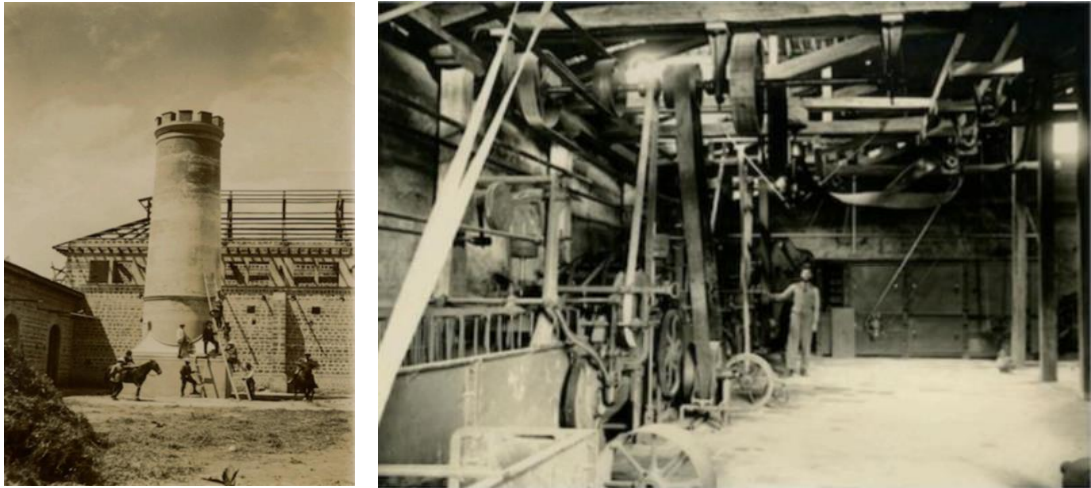


Figure 23. The machinery and the chimney of the sugar mill during the early 20th century in the San José Hacienda (1920- 1930) (INPC, 2015)

The process entailed not only a rupture with the past but also a reallocation of the power associated with that infrastructure to a new set of actors and practices. Yachay was intervening socio-materially with the historical trajectory of those buildings, and of the Hacienda more generally⁷², with the intention to both draw on certain aspects of the Hacienda trajectories, while also breaking with others, through its own materialized expectations. Through these expectations, the government was building a potential future, which they had positioned as desirable. Moreover, through that interaction between futures and pasts, the government aimed to generate in the present a stabilized timescape, a horizon of meaningful actions that could be accepted collectively. It is fundamental to understand here that these repair processes were strongly situated, both with respect to specificity of the history of the place and its peoples, as well as with respect to the contexts the government's

⁷² One could say that the buildings were increasingly in repair, their trajectory conducting to ruination, and based on the literature around the Hacienda system in Ecuador we can say that as a whole it started its decomposition process during the agrarian reforms of 1964 and 1973 (Bretón, 2012; Jordán, 2003; Maldonado, 1980), but with no clear ending. In fact, as mentioned in the thesis before, and in this chapter, the distribution of land and associated agrarian resources continues to be till nowadays extremely unequal in Ecuador, and for many scholars and social movements the agrarian reform remains an unfinished process (Gortaire, 2017; Jordán, 2003; Larrea & Greene, 2018).

authorities were bringing to the project and trying to materialize in it: Yachay as the embodiment of temporal politics of buen vivir; Yachay as a breaking point in Ecuador's history; Yachay as the most important project of the Revolución Ciudadana and maybe its most enduring legacy, along with all the tensions and associated contestations.

I have tried to highlight that situatedness of the practice of repair, while connecting it to the wider dynamics of what was unravelling in Yachay, following the notion present in the repair literature that in order to understand the socio-materiality of the practice it needs to be studied alongside the contexts at stake: *"In order to focus on and explain the specific instance of repair we must necessarily explain the broader activity and surrounding materials within which that instance is situated, and without which it may not have occurred."* (Jarzabkowski & Pinch, 2013, p. 586).

Interestingly, the Korean advisor team initially did not agree with this line of action. In fact, they promoted a different one, which would lead to a different future for the site, in which constructing new buildings from scratch would have been preferable to repairing old ones. Similarly, they proposed to design the University buildings as tall-concrete buildings and not based on the style or materials of the existing infrastructures:

Koreans did not have that concept. For example, there the Korean advice was mega buildings, as is Daejong, as is Seoul, as is Incheon. That is, they arrive and a 40-story tower, because also the logic of land use is restricted, then, they grow upwards, and the capacity of construction is impressive. However, we have a natural environment as wonderful as is the province of Imbabura and the same area of Urcuquí; we are not going to implement such features. So, we combined the logic of that look a bit and decided that we should also take advantage of the infrastructure. Then, in no way, we were going to make them disappear, but we recovered them. (Senescyt authority 2, 2017)



Figure 24. Different moments in the repair and maintenance process in the old Main House of the Hacienda, which would later serve as administrative offices for the university.

Thus, the authorities decided to maintain a symbol of the past both as a sign of its reconfiguration and as the way of announcing a transformed future. Rafael Correa has referred to Yachay as the “train of knowledge” that will change Ecuador’s history carrying it forward (Ecuador, 2012) and he wanted to incorporate that both symbolically and materially in the infrastructures themselves. This centrality attributed to what the government was undertaking and how the macro change embedded in the promise of a “change of the productive matrix” was developing, is associated to the temporal dynamics intersecting in Yachay and how agency over futures was negotiated. As Michelle Bastian argues *“time concepts express collective understandings of how change happens and how the power to enact change is distributed.”* (Bastian, 2009, p. 99). The government was tapping precisely into the situated historical notion of what change meant, how it looked and who could conduct it. Of course, this intention was contingent and other approaches were at stake. The confrontation of the two visions, one arguing in favour of repairing the old and the other arguing in favour of demolishing it and building from scratch, was one of the points in which the government decided to take its own path and go against

the Korean team's recommendations. This tension was present in how ex/president Correa described the process during our interview, and how he attributed agency in his testimony:

We had several meetings; at first, there were crazy projects; in fact, the proposal of the Koreans was discarded. They recommended pure cement buildings and they wanted us to tear down the historic buildings; we discarded it. One of the decisions we took was to rescue the historic buildings: for example, there was a sugar mill and an old hacienda with a chapel and even a jail. The pawns' homes became a student residence. (Rafael Correa Delgado, personal communication, 2018)



Figure 25. A picture I took from the sugar mill after the repair process. The mill now is part of the central plaza of YachayTech, it is surrounded by classrooms and the library.



Figure 26. A picture I took from an information board in one of the patios of YachayTech, the board commemorates the history of the sugar mill that once functioned there putting special emphasis in its historical significance and how at the time it was “one of the most advanced in the country and the region”.

Eventually, the Korean team decided to accept Yachay’s authorities approach to this issue, and they even aligned with their vision in the following months in order to continue working in the project’s development. This alignment with the government’s vision of the future of those buildings was different from the approach some other hacendados took who remained opposed to the plans of Yachay’s authorities and pursued legal actions as mentioned earlier in this chapter. One can see here divergent visions of the future that was at stake, the one proposed by the Korean team based on their own perspective, trajectory and experience, and how it was discarded at least partially during negotiations and daily practice. This vision

lacked in a way the political-transformation element connected to the agency attributed to the government to “rescue” the history contained in those buildings. An element that governmental authorities wanted to be embodied in the repaired infrastructures that would echo the expectations materialized in Yachay. One of the elements that it lacked was precisely the kind of past-future connection that the repaired future model proposed, and the complex temporal politics involved in that process associated with the site’s history.

These processes are of course contingent and remain open for contestation. The emphasis on practices of repair is precisely a way to highlighting how *“social order, then, can be conceived not only as sociomaterial order, but also as the concrete result of the everyday practices of material maintenance and repair.”* And how these practices are conditional on multiple simultaneous trajectories with dissimilar spells, and how specific instances of the practice do not close further reconfigurations neither materially nor symbolically, and thus by *“insisting on the perpetual production of social and material order, these studies stress the instability and potential failures...”* (Jérôme Denis et al., 2016, p. 7). Nonetheless, such connection to the past also acquired a different meaning for the other actors affected by the project. For instance, some actors from the communities observed a similarity with previous hierarchical relations in the reconfiguration of the infrastructure of the hacienda; they perceived a particular way of organizing the space that resonated with a past in which the space of the main house in the hacienda was heavily restricted for the worker. In words of one of the residents of Urcuquí:

Now in operation, this university stands on the reconstructed hacienda, the planners who intervened in it, kept the original architectural layout. It keeps the places where the workers, and previously slaves, received the orders, the same places where the employees lived, where they were punished, and also where mass was taught. Where once was the home of the boss and the foreman, you now find the rector’s office and the administrative offices, where the middle managers of the hacienda lived now live teachers. The place where the workers lived was called “the ranch,” the students live there

now. Times changed, the architecture was rebuilt and is new, the disposition of the power spaces of the hacienda is maintained as if the hierarchical social system was still there. (Gil Eloy Alfaro Reyes, an Ecuadorian researcher of Urcuquí and the San José Hacienda, born in Urcuquí. (Alfaro-Reyes, 2017, p. II)).

The tension materialized in the buildings between a self-attributed ground-breaking character and the use of the repaired colonial buildings, alongside the paradoxical nature of the temporalities embedded into that infrastructure, remained present when the University started operating. When I visited YachayTech during 2017 and 2018 this tension was evident. The Hacienda-style of the buildings, the decoration and space division contrasted heavily with quotes painted on some of the walls of the buildings from authors associated with a revolutionary tradition such as Ernesto “Che” Guevara, Paulo Freire and Fidel Castro (see images below). In this sense, the infrastructures sustaining the running of YachayTech can be analytically understood both as timescapes (Joniak-lüthi, 2017) and as paradoxical sociotechnical assemblages (Howe et al., 2015).



Figure 27. A picture I took during 2017 of the administrative buildings of Yachay in operation and some of the decorations of its walls which evoke the colonial times and the regime of the hacienda.

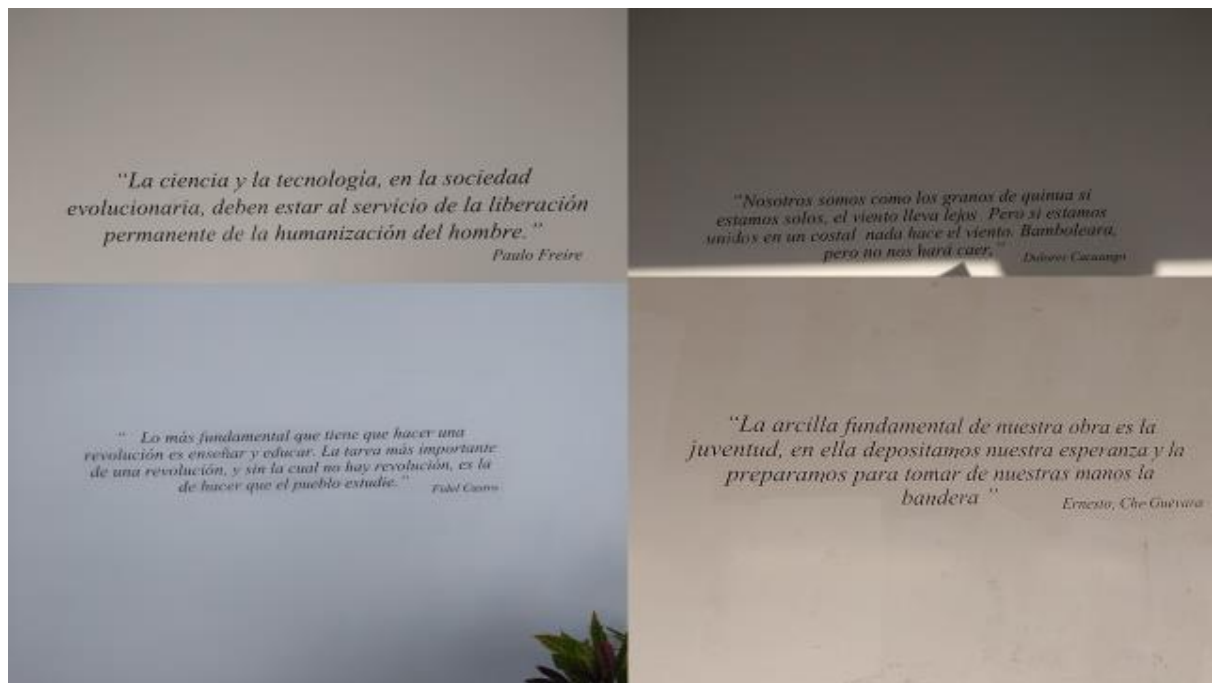


Figure 28. A collage of the pictures I took from the different quotes painted on the walls of the administrative offices of YachayTech. On the right hand lower corner a quote by Ernesto “Che” Guevara painted on the wall of one of the repaired old Hacienda buildings, it reads: “The fundamental clay of our work is youth, in it we place our hope and prepare it to take the flag from our hands.”

Connected to this point, I want to highlight that one of the aspects that a future-oriented project such as Yachay consciously or unconsciously ignored was the history of struggles, and the associated expectations about the future, the people of Urcuquí and the nearby communities had before the project. Precisely because Yachay intersected with these trajectories during a moment in which the Haciendas were breaking down both symbolically and materially, the project also clashed and in many ways shattered the future horizons of the people who saw in the decomposition of the hacienda system a historical opportunity to break with centuries of inequality and domination. And maybe even more importantly, an opportunity to harvest the fruits of the work they had performed during centuries to sustain that land, develop valuable social relations even within the oppressive system of the hacienda and maintain a number of infrastructures and knowledges that were crucial in the operation of the haciendas, and of their own livelihoods as well. I can illustrate this point with an example.

If one reviews the history of Urcuquí and the nearby communities, one quickly realizes how across its history one of the most important matters of concern has been

water, and especially how to develop and maintain resilient water reservoirs and systems for irrigation water. Accordingly, these have been some of the central matters of concern, interest and struggle for the communities across centuries, especially against the hacendados who tended to control these resources and determine their distribution (F Apollin, 2002; Frederic Apollin & Nunez, Pablo, Ruf, 1998; Boelens & Doornbos, 2001). The region of Urcuquí and the communities (ayllus) that lived there before the Spanish conquest, built and sustained from pre-colonial and pre-Incan times, an impressive water supply canal system, one of the main canals composing this system is called “Acequia de Los Caciques” (Canal of the Caciques):

“One of these canals, which was probably constructed in 1582, is called 'Acequia Grande' (Grand Canal) or 'Acequia de Caciques.' It irrigates approximately 320 ha between the altitudes of 2,000 and 2,500 metres a.s.l., benefitting 435 users. The canal is still an earth canal, 19 kilometres long, with a capacity of 200 litres/second. At present, it is managed by a group of rural associations from two parishes, Urcuquí and San Blas.”(Frederic Apollin & Nunez, Pablo, Ruf, 1998, p. 373)

This canal system has been kept across centuries in fluctuating conditions, but for the past 40 years, it has been operating very well and distributing irrigation water for a great number of users. Nowadays, some of its sections work as part of Yachay's irrigation system and water supply system. However, this is only possible because of the work of the Junta de Aguas (water board) and the workers who maintain it in excellent conditions and to which Yachay paid little or no attention, in fact some of the canal's sections that are within the intervention perimeter of the project have been left to breakdown because Yachay EP lacked the resources and the expertise to maintain it in the required conditions. This is seen as an offense for community member and for the junta de Aguas and it is tied to the enormous amount of land expropriated by the project without considering, for instance, how they would maintain this type of already present and valuable infrastructure. In the past, the haciendas had appropriated this extraordinary system for centuries until 1945 when

the communities were able to take it back, on the base of governmental intervention, and establish a “Junta de Aguas” which would then decide upon irrigation services and the distribution of available water for irrigation. In this region, as in most of the Ecuadorian highlands, water means both power and prosperity, as water supply and present irrigation systems give value to the land and make it possible to sustain agricultural production. Therefore, the hacienda-like exclusion from the dynamics of the communities that some interviewees have told me about resonates with a long history of struggles and tensions between the haciendas and the communities. Yachay, voluntarily or not, has tapped into this history and become a part of it.

One of my interviewees, a current employee of Urcuquí Council (and interestingly member of the current water board), told me that one of the reasons why people in Urcuquí and nearby communities had resentment with Yachay was because, as mentioned before in the chapter, when the project arrived abruptly years before, there were very strong possibilities for the communities to organize and buy a significant part of the land from the San Eloy and San José haciendas. This would have meant that they would have regained ownership of the lands after hundreds of years of centralisation and being excluded from them. In a way, Yachay EP’s promises and the expectations they built did not understand the depth of the terrain they were planted in, and the disillusionment of the people cannot be understood properly if stripped of this historical dimension.



Figure 29. Workers of the Hacienda in the main plaza of Hacienda San José during Hacienda times. Source: (Tech, 2017)



Figure 30. The plaza and administrative offices after the repair now used as a section of YachayTech. Source: (Tech, 2017)

As I have tried to portray, during the implementation of Yachay, several historical trajectories came into play and intersected one another. In fact, while these kinds of futuristic-oriented urban planning and socio-technical projects are often associated with, and reduced to, the model of Silicon Valley; the history of this type of projects extends into the past the history of techno-cities in diverse regions of the world from

the very early 20th century (Kargon & Molella, 2008b); and science-cities such as Akademgorodok in the Soviet Union (Tatarchenko, 2016) and Tsukuba in Japan (Anttiroiko, 2005; Dearing, 1995). These reflect ongoing centuries-old negotiation⁷³, around the multiple objectives, social roles, power relations and modes of interaction of knowledge systems and their collaboration/disconnection with other social spheres such as the state, the collective organization of life in cities, the business sector and the civil sphere (Dierig, Lachmund, & Mendelsohn, 2010; Hackett, Parker, Vermeulen, & Penders, 2017). Hence, Yachay should also be read against the long history of ongoing negotiations in Ecuador between educational institutions, the state, political organizations and the sciences. Negotiations that Yachay both shapes and is shaped by.

4.6. Chapter Conclusion

This chapter has analysed several moments in the process of the implementation of Yachay ranging from the selection of the site for the project, the further expropriation of the required land extensions and finally the process of repair of some of the existent infrastructures. Throughout this infrastructuring moment, Yachay was generating-dealing with both repair-maintenance and breakdown-decay on different settings by establishing specific and contingent ways of representing-mobilizing pasts and futures through expectations materially and symbolically. Infrastructures materialize some of these expectations but remain open for reconfiguration. The project has changed across time, with new actor new orientations temporal

⁷³ See for example "The City of the Sun" by Tommaso Campanella in 1623 (Renna, 1999), Sir Francis Bacon's "The New Atlantis" in 1624 , and "Christianopolis" by Johann V. Andreae in 1619 (Bierman, 1963). Across these times, debates and negotiations over the place of knowledge in society were present, especially at a time in which knowledge boundaries were being renegotiated with what was later called the scientific revolution and the enlightenment. This process continued across the 20th century, consequently, "the organization of scientific work and its place in the social order have been under negotiation and construction for centuries, and there is every reason to expect this to continue." (Hackett et al., 2017, p. 734).

orientations come into the project. Both pasts and futures are reconfigured, actualized, many times hand in hand.

Analysing the interaction of different pasts and futures in the processes of infrastructuring across time in projects such as Yachay is crucial to understand how different trajectories, expectations and stories are negotiated, mobilized, ignored or repeated during the material configuration of the projects. I argue that this type of analysis illustrates more comprehensive pictures of the dynamics shaping these projects across time by trying to avoid narratives in which only the role of the state, presumed as a monolithic structure inserted in a given historical or political trajectory, is taken into consideration. Thus obscuring the role and agency of multiple actors within and outside public institutions, and the interconnected multiple trajectories at stake.

In this analysis the place and the historical and sociological understanding of that place is key: the already present dynamics are fundamental as they speak to us about the trajectories and expectations that are already on the field, the knowledge that exists, the specializations in different types of work, social and ecological practices that it is vital to understand. If innovation is a series of configurative movements, then understanding the materials that are already present is as important as focusing on "the new".

This moment of expropriation and, more importantly, what came after it with the construction of the physical infrastructure, illustrate the paradoxical nature of infrastructures (Howe et al., 2015) and their relationship with timescapes (Joniak-lüthi, 2017). For example, the decisions taken in the present during this early stage of implementation shaped multiple relationships with the future. On the one hand, the repair of specific spaces like the heritage buildings, which were described as patrimonial, speaks of an active relationship with the past embodied in those buildings. Nevertheless, on the other hand, it also marked a fractionated start with the communities that lived there in the present. Several of these communities organized and opposed to selling their lands to the "public interest" and they

organized themselves as communities legally so the government could not expropriate their lands. However, an effect of that legal movement was the linking of these communities to the future of Yachay, since they were within the perimeter of intervention and would be then part of the ongoing development of the project into the future. Yachay's administrators, anticipating a possible future, ended up repeating a past with which the Project was in principle aiming to break, i.e., a colonial past where some hacendados ruled by centralizing the land and hierarchically managing the public space. Studying expectations as more than futures is of particular significance in contexts such as the Ecuadorian in which visions of the future cannot be separated from *"...a past whose annihilation was not consummated, because it continued to annihilate itself indefinitely, consuming itself within itself, ending up at every minute but never ending its ending."*⁷⁴

The next chapter, number 5 will focus on Yachay EP and YachayTech already in operation from 2014 onwards, and in developing the notion of relational infrastructures as one of the dimension through which expectations are embedded into sociotechnical projects and shape them along with the actors involved.

⁷⁴ Gabriel García Márquez in "Cien años de soledad", chapter XX. The translation is mine

CHAPTER 5. Yachay EP and YachayTech in practice

5.1. Introduction

The implementation of the initial infrastructure described in the previous chapter, chapter 4, finished in 2013 and by 2014 with the inauguration of the University, by then already named YachayTech⁷⁵. Yachay was no longer just a future entity inhabiting the imagination of its designers, nor the master plan that would ideally guide its development. The project's future orientation would remain a fundamental component of its dynamics but now Yachay was also connected to the shorter timeframes of institutional performance, both of YachayTech and Yachay EP, and to the shifting unpredictable political and economic circumstances of Ecuador's present. The expectations created during the design and early promotion of the project outlived the economic and political situation that permeated the emergence of Yachay as a project. This tension between the initial expectations and the actual dynamics continued to grow as the project was implemented, encompassing many aspects of the project and permeating much of the public imaginary around it.

This chapter focuses on the dynamics of the two main institutional entities created to implement Yachay: Yachay EP, the public enterprise, and YachayTech, the university. In it, I will describe significant processes and events in the history of Yachay EP, YachayTech and Yachay as a global project. Accordingly, the main objective of this chapter is to unpack the different actors that entered the project at different points in time, the subsequent change in internal organisation and hierarchical dynamics, and how different expectations intersected with the infrastructural components of the project. These elements will be addressed within the scope of the political and economic trajectories of the Ecuadorian state at those points in time. In other words, the interlocking political and economic contexts,

⁷⁵ This chapter will describe how the University received that name and which were the actors involved in this process.

personal trajectories and the institutionalisation of the University, all happening at the same time and unravelling with multiple durations.

Previous chapters have paid special attention to the government's agency, in the form of dissimilar actors within the Ecuadorian state, in the emergence and early implementation of the project. Nonetheless, as this thesis pursues the life of Yachay as an infrastructural project and the different temporal dynamics involved in its trajectory, it should be noted that even before the project went public there were already other non-public actors, with their own interests, who were attentive to the project and drawn to becoming part of its contingent reconfigurations. For example, this was the case of the Korean team from IFEZ who became involved in the infrastructuring process, by drawing on their own experiences and set of skills, from the moment when Yachay was up-scaled from a technical University into a city of knowledge. The involvement of other actors became ever more present from the time when the project became public, and the early implementation portrayed in the previous chapter followed the selection of the site for Yachay. This meant that new actors with their own interests and expectations, along with different contexts came into action.

Focusing on the deployment of Yachay across time allows then not focusing directly on actors but on the infrastructuring process of Yachay, and how different sets of actors, histories and sites are both connected through it and shape it significantly without ever monopolizing that capacity. This chapter will describe how these processes unravelled in both Yachay EP and YachayTech, how the relationship between both institutions was shaped with respect to their own temporalities, and how through Yachay different sites and relational infrastructures were linked. This chapter develops the concept of *relational infrastructures* on the base of the dynamics and events I observed in Yachay and beyond during my fieldwork. The concept aims to capture the relations between actors, but not necessarily reduced to them, which serve as base for other relations. It aims to capture the collective component of actor's orientation across time as well as the connection in infrastructural processes of both human and non-human entities without leaving

matters of power and the relevance of past trajectories unattended. The next section of the chapter describes the concept in detail.

The chapter is divided into 3 main sections aside from the introduction. First, the extensive initial section will trace internal differences between the project's authorities regarding perspectives of its present and future, the mediation of international influence (namely, that of the Korean advisors of Incheon Free Economic Zone-IFEZ) and how this tension shaped Yachay and particularly Yachay EP from the onset. I will briefly describe one of the crucial decisions taken by the administration of Yachay EP when the Korean Team delivered the Master plan and they had to decide if developing a general Action Plan would be necessary. On the next section, I focus on the institutional, administrative and academic transformations the University experienced before and after its inauguration in March 2014, and during the administration of its different Chancellors. The section will describe how expectations evolved across time as the project developed, how students and academics were attracted to the project and the problems they faced once in it. Finally, the chapter ends with the conclusions that provide general reflections of the themes addressed across the chapter and sets the scene for the next chapter with the 2017 national presidential election knocking at the door.

5.2. Yachay EP's consolidation, the selection of Héctor Rodríguez and relational infrastructures

5.2.1. Infrastructures and relational infrastructures

This brief section reintroduces the literature on infrastructures and situates within it the concept of relational infrastructures that will be elaborated and applied across this chapter. The next section explores the early consolidation of Yachay EP and the repositioning of actors that followed the start of the implementation of the project as a whole.

Infrastructures have increasingly become a topic of interest both within STS and for a number of interdisciplinary studies. Infrastructures have attracted such interest not the least in part, because they increasingly occupy governmental preoccupations,

economic stimulus for transnational investment and have become a matter of concern for science as a whole since the sciences shape and are shaped by the emergence of e-infrastructures, cyberinfrastructure and e-science (Edwards, 2009; Penny Harvey, Jensen, & Morita, 2017; Pollock & Williams, 2010a). The word infrastructure, adapted into English from its original use in nineteenth-century French civil engineering, has a military origin that describes the stable fixed facilities on top of which organizations operate (Blok, Nakazora, & Winthereik, 2016). It has traditionally been referred to the more or less invisible or pre-assumed technological components over which social life operates: water systems, power grids and electric systems, telephone and other communication networks, transportation systems, buildings, military bases, among others. Materiality has been a major preoccupation in the literature around infrastructures in respect to how infrastructures provide contingent order to social interaction by shaping communication, transportation and organization at various scales and becoming both enablers and confiners for individual and collective agency (Amin, 2014; Star & Ruhleder, 1996). Scholars in the literature have also highlighted how infrastructures are made to work as a foundation for social dynamics; in this sense, they do not constitute an inherently invisible or structural dimension but rather are made to work that way. In the view of Ashley Carse who investigated the etymological origin of the word and its reconfigurations across time the word itself invokes a foundational character: “As the prefix *infra* – meaning beneath, below, or within – suggests, infrastructure diverges from system and network by suggesting relationships of depth or hierarchy.”(Carse, 2017, p. 27)

Understood this way, infrastructure can be appreciated as a temporal concept at least in two ways. First, the deployment of infrastructures can be understood as an activity that unravels across time rather than once and for all, while also being a practice that deals with multiple temporal scopes in tandem as it incorporates in the now multiple futures by anticipating potential uses, risks and attempting to achieve stability. This dimension has been captured in the concept of infrastructuring (Blok et al., 2016; Bossen et al., 2014; Pipek & Wulf, 2009). Second, their character of being “*infra*” or invisible depends on the point of entrance and duration of the observation

in their lives one makes as a researcher. Infrastructures are made to be infra and stable in relation to something else, contingently and temporarily (be it for long or short durations). In fact if seen through the scope of long-duration historical time or geological deep time, their seeming essential stability and durability becomes structurally vulnerable. The authors explain: “on geophysical or even long-term historical, time scales, infrastructures are fragile, ephemeral things... we could say that on long-historical and geophysical time scales, breakdown is a natural property of infrastructures, or instead a property of nature as infrastructure (on which all human-built infrastructures ultimately depend). Thus modernity can also be depicted as a condition of systemic vulnerability.”(Edwards, 2003b, pp. 8–9)

Consequently if studied across time, like approaches such as the BOAP suggest (Hyysalo et al., 2018; Pollock & Williams, 2009; Williams & Pollock, 2009), one finds that at different times, infrastructures themselves rely on other infrastructures and practices to become infrastructures, and their sustaining dimension is relative both in regard to time and with respect to the specific actors involved. As explained by Star & Ruhleder, “Within a given cultural context, the cook considers the water system a piece of working infrastructure integral to making dinner; for the city planner, it becomes a variable in a complex equation. Thus we ask, when—not what— is an infrastructure.”(Star & Ruhleder, 1996, p. 113).

Furthermore, current research and theorization around infrastructures in regions of the world different to Northern Europe and North America brings to the fore discussions about other characteristics that had been underexplored or overlooked (Furlong, 2014). Such as the heterogeneity of infrastructures connected to precarious and hybrid conditions where instead of one universal and constant system providing a function, such as clean water supply, there are multiple systems coexisting in more or less frictional manners (Furlong, 2014; Lawhon et al., 2018). Many times these heterogeneous infrastructures can often be unreliable, intermittent and have persistent malfunctions tied to relentless disrepair, elements that shape and are shaped by the relation both users and the people maintaining those infrastructures establish with them based on their experiences of this undependability (Furlong,

2013; Graham, 2010; Gupta, 2015). Similarly, authors have insisted on analysing the political histories shaping the development and use of these infrastructures, while recognizing the present power structures and the intergenerational inequalities shaping the multiple relations involved in how different groups design, use and reconfigure infrastructures (Anand, 2015; Boelens, 2015; Chu, 2014; Joniak-lüthi, 2017; Reeves, 2017; Schwenkel, 2015). This by no means entails that all infrastructures work poorly in these regions of the world, or that the infrastructure ideal is real in the traditional contexts, but rather that other elements that are often unnoticed need to be taken into account, and that people establish ongoing practices around infrastructures that operate far from the “modern infrastructure ideal” (Furlong, 2014). In other fields, the concept of infrastructures has been expanded and applied to ecosystem-related components that constitute natural infrastructures or green infrastructures that support the life of humans and other species. In addition, these natural infrastructures are increasingly taken into account when assessing the resilience and vulnerabilities of human communities and ecosystems, at multiple scales, in the midst of climate change (Bennett, Cassin, & Carroll, 2016; Ochoa-Tocachi et al., 2019; Sutton-Grier, Wowk, & Bamford, 2015). Similarly, the investment and concern about the sustainability of infrastructures are increasingly analysed in tandem with the consecution of global development objectives and how regimes of governance are a key element in these relations (Thacker et al., 2019).

My research draws and aims to contribute to these theorizations, acknowledging the increasing interest beyond the social sciences to capture the political and governance-related dimension of infrastructures. For instance, Thacker et al. define infrastructures in the following way in their study of how these intersect both positively and generating lock-in effects with paths for sustainable development across the globe: “Our definition of infrastructure includes physical assets in the five categories of infrastructure as well as the human and governance systems that are necessary to sustainably deliver services from those assets, including various versions of planning and organization.” (Thacker et al., 2019, p. 330). The concept of relational infrastructures aims to contribute to this growing literature by indicating one of the

ways in which infrastructures weave together individual and collective trajectories, putting especial attention into the power-dynamics and nested character of sustained social relations. The concept highlights how actors who become part of a new assemblage or sociotechnical project are already part of other assemblages; their trajectories are already imbricated with trajectories with longer durations such as internal struggles in a political party or a specific social network. The relations that the actors establish in the present are also, but not only, constituted on the base of previous relations, that can be more or less stable across time.

Relational infrastructures tries to highlight how already existing relations serve as base, and are made to work as underpinnings, for new relations or for the expansion of relations to other settings. Sometimes, as I will show, the participation or involvement itself of actors into sociotechnical projects such as Yachay is made possible by being part of stabilized relational infrastructures in other spheres. Moreover, the concept tries to capture how, these other relations become embedded in the trajectory of the project or assemblage at hand in the present, and how these processes may remain out of sight if not studied across time. The stability of these, as of other infrastructures, cannot be taken for granted across time, and depends on practices of preservation of those relations that are enacted in the present. This means that actors besides being involved in shaping the infrastructure at hand, will also be interested in maintaining, sustaining over time and developing the relational infrastructures of which they are already a part, through their activities in the present. Relational infrastructures are a part of the dynamics of an infrastructure but are not limited to it. As with other infrastructures, their visibility or invisibility will be shaped by the particular positioning of actors within the sociotechnical assemblages analysed, by the researcher's own positioning, and by the temporalities embedded in these relations.

The concept also aims to operationalize the methodological principles of the BOAP approach that aims to study technologies and sociotechnical organizations across time, and not only based on single entry points from where to draw general conclusions about the technology or the social groups interconnected to it. Authors

argue that “the studies must encompass the multiple loci and times wherein sociotechnical change is shaped and move beyond singular ‘snap-shot’ accounts” (Hyysalo et al., 2018, p. 5). I try to apply this principle to the analysis of the relations one encounters when researching infrastructures or technologies across time, through different stages in its life and consequently in different settings. Relational infrastructures are observable through this temporally sustained observation, not only of actors or practices, but also of the specific relations between actors that are stabilized across time and settings, while shaping, and being shaped by, those actors and the new assemblages they join. This allows a longitudinally sustained observation of how some relations become infrastructural to the operation of several infrastructures, organizations and to the activities of specific actors. This longitudinal observation, in my case, is conducted by following the life of Yachay across time while also taking in account the historical dimension of both the political and economic settings of Ecuador, as well as the trajectories of the actors and the relations that connect them beyond Yachay itself.

Relational infrastructures are a sustained mode of engagement, which is fundamental in shaping the modes of operation of infrastructures. This is, both the relationships established between human beings as well as with non-humans, both organismic like animals and plants, as well as with other beings like artefacts. These connections may be long-lasting and deep, or be recently formed and volatile. The word infrastructure itself, differently from the word network, conveys a depth and a temporal layering that are often missing in analysis that portray sociotechnical assemblages as if they were flat ontologies, existent only in the present. In this sense, I propose that the concept of relational infrastructures captures better the power-infused ongoing-relations than a general use of the word network would (Carse, 2017, p. 27). Once these reflections have been introduced, the following sections of the chapter will deal with the empirical data collected for this period in the life of Yachay.

5.2.2. Yachay EP's emergence and the selection of the General Manager

Yachay emerged in the intersection of a number of trajectories, as Ecuador's then government combined in Yachay the City of Knowledge both a new sustainable planned city, with all the social complexities this brings to the fore (Eames & McDowall, 2010; Fressoli, 2014; Joss & Molella, 2013), as well as designing it as a regional innovation system that aimed to trigger a knowledge revolution in the national economy. This section investigates the formation and dynamics of Yachay EP – the public company briefed with the task of implementing the project – in relation to its connections with the central government, the expectations initially generated for the project and how these while they were materializing were exercising an equally incremental compulsory force on its leaders: to show progress, to display promises fulfilled, to break precisely the distance that sustains the tension between present-expectations.

Here I analyse how what happened in the government in economic and political terms influences the dynamics of Yachay through its authorities and the distribution of priorities after the earthquake and crisis. The government declared Yachay a "fulfilled promise". What this meant for its public visibility and within the government itself, what was required of Yachay and at what rates? Yachay was expected to show results for all those almost immediately not only for the government itself, but also to the media. This led to both narratives and presentations of the project in which the future was collapsed into the present as already imminent in the results Yachay would generate and the visualizations that seemed to be immediately available. In brief, these settings generated 'foresight compression' (Schwyter & Calvert, 2015; Williams, 2006) accelerating the project and valuating each of its changes as being a sign of realization or failure.

On March 13, 2013, the Public Company, Yachay Empresa Pública "Yachay EP", was created by the Executive Decree 1457 published in the Official Record Nr. 922 of the 28 of March 2013, and through resolution No. DIR-YACHAY EP-2013 of March 28, 2013, published in the Official Register Nro. 946 of May 3, 2013, the Directory of

Yachay EP designated *Héctor Eduardo Rodríguez Chávez*, as General Manager of the Public Company. Yachay EP now had legal personhood in order to manage the ZEDE (Zona Especial de Desarrollo Económico)⁷⁶, forming its own structure and obliged to generate basic infrastructures in managerial and legal terms. It gained a large amount of resources upon its creation. In fact, Yachay was incorporated both into the National Plan for Buen Vivir and in the national strategy for the change in the productive matrix both the guiding plans in Ecuador's periodical planning system (SENPLADES, 2013, 2014).

On the day of the inauguration of YachayTech, Correa made a quite ambitious statement that pointed to the revolutionary character of the objectives pursued in Yachay: "an Ecuador that projects itself into the future as a sovereign country that has decided to base its development on the only inexhaustible source of wealth: human talent, knowledge ... today begins another boom, that of knowledge, which will last forever because it is an unlimited resource". (Rafael Correa, Ecuador ex-president. 31st of March of 2014). As a result, the definition of who would be in charge of such a project could be seen as a transcendental one. Under this light Héctor Rodríguez's selection as the general manager of the Yachay EP, was a decision that denoted openly a vote of trust in him, when I asked ex-president Rafael Correa about this decision, he responded:

"Hector was close to René (Ramírez)⁷⁷, he trusted him. He is a good boy (chico), maybe too young." (Correa, 2018)

⁷⁶ The Especial Economic Development Zones are a legal figure developed in the Ecuadorian state to serve as economic "free zones" that have special tax regimes and other incentives oriented to attract national and international private economic actors. They are defined as "Customs destination in a limited space of the national territory for the settling of new investments. For its location, the following conditions are considered: preservation, potential of each locality, infrastructure, basic services and others. Oriented exclusively to export and strategic imports substitution. Tax exemptions and tariff reductions are granted." <http://www.inteligenciaproductiva.gob.ec/zonas-especiales-de-desarrollo-economico> (last visited on the 18-01-2020)

⁷⁷ René Ramírez, who appeared in previous chapters, was a key actor within Correa's government, one of his closest allies, and someone who occupied during Correa's decade in power a number of high positions ranging from National Secretary of SENESCYT as well as being the head of SENPLADES. As

Hector Rodríguez's election as general manager of the EP can be analysed as a configuration of both Yachay as a project and the context with which it would resonate, especially concerning what the political context would be for Yachay. This meant that selecting Rodríguez was already a contexting effort, as he was attuned to what the central government considered the most relevant aspects of Ecuadorian reality, he would be aligned politically to the electoral rhythms and be accountable in more than formal levels.

Rodríguez was considered as reliable by Alianza País high authorities, even when he was not a member of the high authorities neither of the party nor of the government. His transition into Yachay's general management also shaped his political career as the amount of responsibility, as well as power, denoted by the appointment was higher and much more public than his previous positions within the state. Before Yachay his political career and governmental positions had been in connection, and in dependence, to the political career and positioning of René Ramírez. Rodríguez had operated as his assessor and had played a number of complementary roles in different institutions; they travelled from institution to institution together. Being selected for Yachay after having been part of the conception of the project meant that Rodríguez was ascending within the ranks of the government, expanding his influence, and thus reshaping the current political networks and coalitions. In addition, the future perceived success or failure of Yachay would be tied to his figure, and reinforce the future developments, productive or destructive, of his own personal professional and political career. One of the questions one could ask is why him and not Ramiro Moncayo, whom had been in charge of the project since 2011 as project manager within SENPLADES and after the transition to SENESCYT. Many of

Chapter 3 illustrates, he was involved in the creation of Yachay and remained a critical influence across Yachay's life until 2017. When speaking about relational infrastructures it is interesting to note that Rafael Correa was his teacher during Ramírez' undergrad education. This was not an isolated instance as a different interviewee I spoke with had also been a student from Correa and would eventually work in the government, in a position close to the president. (With respect to René Ramírez see for example <https://www.elcomercio.com/actualidad/politica/rene-ramirez-versatil-capitan-de.html> (last seen 18-01-2020)).

my informants mentioned that he was expected to be selected as the general manager of Yachay EP.

In this case, the high government authorities decided to select Rodríguez as he was much more aligned to the political ideology of the ruling party, and had what they perceived as a more significant trajectory in public office. Here I want to argue that with this selection, there was something more going on. Rodríguez's selection was a way of activating already existing relational infrastructures within the government, relations that through his positioning as Yachay's general manager would be able to influence more directly the development of Yachay across time. For example by infusing with their own perceptions the emergent challenges and framing the future horizons not only for the project itself but also for the development of their own relational infrastructures. These actors were developing in tandem their personal political and professional careers coupled to those previous existing stable relations. In this sense, Héctor Rodríguez selection was also a way to set a context from the start concerning the framing of which elements mattered most of those simultaneously unravelling in Ecuador, and connected to that, the project, which elements would be considered as essential points of references for action and decision making. In other words, the selection of Héctor Rodríguez was a way of *contexting* specific elements of Ecuador's political dynamics as well as particular sensitivities to potential future emergent priorities. I will try to exemplify these points throughout this chapter.

Infrastructure literature outside of STS is now targeting the social components of it, and here it is critical to understand relational infrastructures and how that infrastructure joins individual paths with collective institutions and processes. They are social and physical; they depend on the regulatory and administrative regimes in which they arise, it is vital to make this relational character visible because it shapes the development of infrastructure at its different times and is modified as the actors enter and leave the project. The critical element to have in mind is that the infrastructuring of the project both in its physical as well as in its legal, administrative and narrative moes was being developed hand in hand with what I would like to call

relational infrastructures. These relational infrastructures are the bonds and coalitions, already existing interrelations both official and informal, through and on the base of which, infrastructures are designed, implemented, reconfigured, managed and governed. The role of relational infrastructures is vital in projects such as Yachay as it brings into future-oriented assemblages elements of already existing dynamics, such as coalitions and alliances, which will shape both the projection of those future orientations, as well as understandings of the priorities at stake, many times stabilizing these priorities in the form of contexts; and thus, laying the foundations which would shape modes of implementation, modes of accountability and modes of understanding-shaping-dealing with collective temporal phenomena such as expectations and compressed foresight.

In the case of Yachay, I argue that the specific relational infrastructures activated during its implementation shaped a particular relation to the imagined futures, the expectations mobilised by the government and the rhythms through which the project would develop a particular resonance with political temporalities. Far from being a specific phenomenon, the development of Yachay as a relational infrastructure is connected to the ways Rafael Correa's government unravelled across time and can serve as a lens to observe why BOAP approach authors argue that "an event is seen as simultaneously constituting and being constituted by broader patterns"(Hyysalo, 2010, p. 51). Then, the stabilised contexts and the practices happening within Yachay can be understood as always unravelling along one another with different speeds and rhythms of change and shaping each other.

The importance of thinking about the notion of relational infrastructures is to understand how the actors involved in the project (academics, politicians, students, public servants, community members, landowners, etc.) were already part of networks when they entered the project. Networks that temporally extend to the past, and require maintenance if one wishes to remain in them in the future. In the case of politicians like Héctor Rodríguez, these networks were internal to the party as well as constituted by personal experiences outside the party. And his position in the party towards the possible futures also depended on the contingent progress he

was able to show in his management of Yachay. This relational infrastructure must be taken into account when we talk about the Ecuadorean state as the most important economic actor in the national economy. Sustaining this infrastructure and extending it to generate political stability was one of the critical aspects of Correa's government. Hence, his immense attention to elections, to maintaining a unitary party position in a variety of topics, to placing people he trusted in charge of flagship projects, etc.

A central theme of the chapter is how the expectations generated in Yachay, i.e. the future promised and partially visible, collapsed both in the promoters of the project and in the critics of the project in a short time. On the one hand the government announced in April 2014 (just one year after the creation of the EP) Yachay as "a fulfilled promise of the citizen's revolution" (C. Yachay, 2014) describing it as a project already carried out and therefore that could already be judged. On the other hand, its critics declared it already in August 2015 as "an announced failure" and part of the "government's projects condemned to failure" (Ayala-Mora, 2015). It is surprising as a project planned for a 35 years construction period, and that span without counting the time it would take to reach its potential, has been, in a period of 5 years and a half since the start of its implementation in 2013, already declared a failure or a fraud on several occasions and from various positions (Bucaram, 2015; Pallares, 2016; PCMLE, 2016), it is judged as a completed project and representing the biggest failure of the previous government. The same expectations that scaled the project up regarding the dramatic impact it was supposed to have on the whole economy and education system (see chapter 3 of this thesis and (Ecuador, 2014)), and the amount, and ambition, of the investment required, made it possible for the media to use those same expectations as a measuring tool against to which compare the "realities" of the project. The expectations that allowed the project to gain political, juridical-legal, economic support and strength, were re-constructed by some communication media as standards to judge it and treat it as an embodiment of the government both in its possible achievements and as a symbol of mismanagement and a waste of resources. In a few words, a failure representing the whole of Correa's government.

On the same line of analysis, the study of this project cannot leave aside the analysis of the internal relational infrastructures of the government operating the state, the negotiations and internal divisions, and the struggle of visions. In the case of Yachay EP, the political line pursued by its managers demanded a need to maintain their political positions while justifying their decisions as leaders of the project. I have referred to these relations as part of the relational infrastructure to which the project is linked. Infrastructures that at the same time are reconfigured during the project by constituting relationships through which decision processes are supported, distribution of responsibilities are justified, the selection of new employees is performed, and the information flows towards the rest of the state are modulated. In the case of René Ramírez, he can be located within the perspective of multiple actors as the mediator between Yachay, the president Correa and other high authorities of the state.

5.2.2.1 Yachay's two locations and the different practical rhythms of the different actors involved

Until very recently Yachay had two different offices: the main headquarters were in Quito, the capital, and other administrative offices were located in Urcuquí. From the around 500 employees working for the project just a small number of them lived in Urcuquí or in the communities nearby. Most of the workers who had to develop their jobs in Urcuquí travelled daily from Quito to the site in a bus provided by the company. This was also the case for many of the managers of the different directions of Yachay EP who only travelled to the site when required for some specific activity or an important event. Other managers did live in Urcuquí or in the nearby city of Ibarra, especially those related to the area of communitarian relations. The general manager Héctor Rodríguez himself did not live permanently in Urcuquí, and he worked some days in Quito and others in Urcuquí. Most of these people did not want to move their entire lives to the project's site that was still unfinished and would imply leaving their families behind. The project occupied a site far from their previous

daily lives both spatially and temporally, the infrastructuring process was underway, in the making, but they had to navigate this in particular ways.

One element that I think is relevant to understand how actors within the EP see their work and the project itself is to understand what their work demands and allows them to do, at personal and professional levels. One of these elements is the time demand of working for Yachay. In the months I spent there, I travelled at least 15 times in the same route some of Yachay's employees take every day to Yachay from Quito. This bus departed every day at 6:00AM from Yachay's office in Quito and arrived at Yachay the city around 9:30 AM. The trip was long; very early (in Ecuador all year around the sun rises at 6:00AM) so people usually arrive 10 or 5 minutes before the bus departs while it is still dark. Most people sleep the whole trip and the bus is a common interparroquial bus not very comfortable for sleeping.

This route runs along the Andes region of Ecuador from Pichincha, the province in which Quito is located, to Imbabura, the province where Urcuquí is located. Yachay lies in the Urcuquí valley at 2300 meters above sea level, very close to the lower slopes of the Imbabura, an imposing potentially active volcano that gives name to the region. By the time of my first fieldwork period, a significant percentage of Yachay's workers still made the trip daily and returned to Quito at 5:30pm when the return bus departs from Innopolis, an entrepreneurial incubator centre located at the entrance of Yachay, and is arriving in Quito around 9:00pm – 9:30pm. Then, they have to take other forms of transport to get to their own places in different areas of the city, only to start the cycle again the next day.

This is not an easy schedule to have daily, and it has become a problem. This is so, because many of Yachay's workers from a diversity of areas do not want to leave Quito, and even if they did there is no accommodation ready for them in Yachay. From what I have spoken formally and informally with some of them, their social networks are a vital part of their decision to remain in Quito. The requirements for working in Yachay are demanding in respect of time, some of the people I have spoken with have had to move during the week to Urcuquí and travel the weekend

back to Quito, this has had an impact on their personal networks including their families. Others have moved permanently to Urcuquí, most of them young single people or lecturers from the University whose entire labour is developed in Yachay. I tried to capture these experiences in this entry from my fieldwork journal:

I am on my way to Yachay, in order to arrive there from my parents' house in Quito I need to travel for 4 hours and a half. That time gives me the opportunity, or the obligation to think in many things, it demands a lot of patience and the route crosses two provinces of Ecuador. Many people have to travel this way every day, for example, one of the workers with whom I spoke had to leave his home at 5:00 AM and he arrived at his house back around 9 pm or 10 pm. He went to live in Urcuquí for a while, but he didn't adapt, Urcuquí is a small town with different rhythms than Quito, the social life is much more limited and less varied than in cities, infrastructures often lack compared to Quito from his perspective. Today he lives in Ibarra, a city 30 minutes away from Urcuquí, and on weekends he travels to Quito. He lives in that motion that certainly reduces his time with his family, friends, the normal circuits of his life before Yachay. Yachay modifies the times and personal rhythms of the individuals, at a basic level it demands that change, that adaptation, that action product of the attention in the project's own rhythms. Returning to the travel experiences to Yachay, it makes sense to think about them from the perspective of a person in transit who lives outside of Imbabura because the intention is precisely to attract entrepreneurs, investors, industries from all over the country.



Figure 31. Yachay EP's offices in Yachay near Urcuquí, I took the picture on one of the first days I visited this site of the project. The bus arrived daily from Quito at around 9 AM and departed towards Quito at 5:30 pm. Each leg of the trip took around 3 and a half hours depending on the traffic and the state of the roads. The building on the left is Innopolis, a centre for entrepreneurship built by Yachay EP's administration to host events and provide various services for interested entrepreneurs. Innopolis is just besides the offices of the public enterprise in Yachay.

These experiences were common among workers from the EP and from the University, the fact that Yachay was both in the making, and also that the future prospects of the project had not completely settled, made it difficult for actors to adapt to the demands and specificities of the project. Yachay was undergoing a infrastructuring phase but it was also already in operation in many ways, so people had to deal daily with the incompleteness of the project as well as with the rough side of promises, the uncertainty of their making.

Even so, most of them do not see this tension as unbearable, one of the elements that emerged from my observations and interviews is the level of creativity and responsibility they feel the project affords them to have. To share an example, two of the people involved in the area of territorial management of the City had a long career in urban planning and had worked in different periods in Quito's city council. When I interviewed them they both indicated two significant traits of their daily work:

great pressure and a sense of intensified responsibility for the work they were doing and the public scrutiny around it; and, interestingly, a sensation of creative freedom, of enhanced generativity, of excitement, emerging from how their work gave shape, ideologically and materially to the project. They mentioned the capacity of building from scratch and designing urban life from ideals as being both arduous and greatly significant for their personal careers. In this case, the sensation of creative power and enjoyment there appears to be a less mediated relation between individual actions and social outcomes, and between individual work and visible results. Similarly, there is less latency between individual (and collective) actions and their reflection in the infrastructures, always depending on the relational infrastructures operating. This was captured in one of my interviews with one young public employee who had arrived recently from London, where she studied a masters sponsored by the scholarship scheme of the Ecuadorian government. This is how I described her experience in my field journal, after a long conversation, regarding Yachay and what motivated her to join the project:

Today in the afternoon I met Nelly, we talked for a long time and she told me several things about her experience in Yachay that I consider interesting and decisive. She worked there for almost a year and a half, she arrived after studying in London to work there and she worked in the Direction of Planning. She mentioned she arrived in Ecuador with a lot of energy and ideas about what could be done in the country, with a lot of push. When she entered Yachay, it was a great opportunity to contribute directly to the creation of that city within her area of expertise, which is architecture. Almost no other places could offer her this type of opportunity, working directly in the making of a city from the start.

I also spoke with local authorities from Urcuquí council, local actors from Urcuquí and nearby communities that are part of the area of intervention of the project or whose daily lives have been modified since authorities started its implementation and

people that were part of the design process of the project and had privileged access to the early stages of Yachay's development. I was also able to conduct a series of informal interviews that I consider were very useful to have a more solid notion of the interests, actors, alliances and matters of concern in play. I could not tape these interviews due to the delay in the approval I required from YachayTech to formally interview students, authorities and teachers. Nonetheless, I was able to develop important connections with stakeholders in the University that connected me with both students and authorities of the institution. Talking to different public employees and authorities at the EP and with academics and students in YachayTech I realized that their daily agendas, planning, and practices were attached via coordination to a set of diverse and different elements from other areas.

For instance, for the Direction of Communitarian Relations, their activities are adjusted to the temporal organization of the communities they work with: work schedules of their particular labours especially agriculture, mobilization times, the beginning and end of the cyclical periods of their leaders, agricultural cycles that couple them to the times of the soil, the weather, seasons, etc. This demands attention and adjustment in order to achieve coordination. This is underlined in the following entry of my field journal:

Today I spoke with ... from the area of communitarian relations, he told me about those activities in which his management is currently occupied with: they are closing the year, which means the end of the cycle for the majority of leaders from the communities, their period as leaders is ending. Then it is a time that demands him and his team to be aware of this and the organization of their own activity depends on paying attention, adjusting and acting on these cycles. January, on the other hand, is a month of negotiation with the new leaders and directives, it demands some attention to the new actors, their interests, and generating

links again. These are times that open momentarily and at the same time demand special attention as they allow their direction to generate certain key activities such as establishing new links and cementing accountability. December is a closing month in every way, they are also preparing a festive treat for the children of the communities, an end of the year event, promoted by the employees of the EP.

This lead me to think that different managements in the project have differentiated times when they have to be aware and organize themselves internally to different external times which are themselves tied to other actors and non-human materialities. For example, in the case mentioned above, meetings with community leaders require adjustment to their life cycles, but this changes from direction to direction. In the case of Commercial Direction, they have to adjust and pay attention to the times of National ministries and private companies, in the case of the Planning Direction, the time has to do with the access to fiscal resources and to the intent to secure resources for years to come, in order to finance purchases, constructions, and all specified in their yearly budget. Some consist of more concrete tempos as natural or bodily rhythms, and others more abstract linked to indicators placed on themselves by the national government or the high authorities of the EP.

Finally, one of the key issues to highlight is that Yachay EP was still in its own constituting process while it was already in charge of building the project, including the university. This was the case, due in part to the time-lines set for the project, from the date for the inauguration of the university defined for early 2014, which infused pressure from the beginning to the rhythms of the Ecuadorian state in terms of legislation processing (the ZEDE case is exemplary in this). Thinking about it in terms of infrastructuring, one can point to the combination of several time horizons in the present of Yachay EP. This combination of several temporal horizons, not always consistent among them, is one of the paradoxical characteristics of infrastructures (Howe et al., 2015) because they point simultaneously to a long future, but they have

to work on the now and are embedded in the current contexts at stake that in turn can position other emergent needs-requirements. While the EP was already being administratively infrastructured that same administrative infrastructure was in use in order to process all the elements needed to build the university.

For example, public servants were already involved in defining its academic model, dealing with the physical repairs and constructions, conducting an international search for potential academic authorities, familiarising with the educative system's laws and regulations, defining the degrees that it would offer, etc. There was little time for latency; there was little time for waiting or consolidating before the EP had to enter the dynamics of fulfilling expectations in practice. There was a process of infrastructuring, but with the infrastructures being used as they were still forming, not yet consolidated. Hence, a reflection is needed that speaks about those uses of infrastructures that happen before it is completed or has reached a time where one can speak of an initial consolidation. Infrastructuring could capture this phenomenon that is very present in contexts where time horizons quickly compress at any time.

5.2.2.2 The Perfect storm, the temporalities of relational infrastructures and compressed foresight

One very relevant moment in Yachay's life occurred during 2016 when what some of my respondents called "the perfect storm"⁷⁸ emerged. This so-called *perfect storm* had a national impact and had three main sources. First, the 2016 earthquake in Manabí on the coastal region of Ecuador that had enormous human and economic damages. Second, the fall on the international prices of crude oil that diminished public funds drastically as Ecuador's economy as a whole, and governmental funding more specifically, is worryingly dependent on crude oil extraction and export as

⁷⁸ In Spanish, the expression is "Tormenta perfecta". It was mentioned to me by various actors within the government, including ex-president Rafael Correa, a public official who worked close to the circle of the president, officers from SENESCYT and some of the managers of different directions of Yachay EP.

mentioned across the thesis. Third, the strengthening of the US dollar internationally meant that Ecuador and its products, as a dollarized economy since 2001, became more expensive for neighbouring countries like Colombia, Perú, and other commercial partners, so Ecuador's exports declined significantly (Gachet, Grijalva, Ponce, & Rodríguez, 2017). Having positioned these 3 separate events within a common narrative: that of the perfect storm, from my perspective I would say having weaved them together into a context -this is contexting them⁷⁹- decisions started to roll out accordingly across the state apparatus. The central government reorganized the available resources and decided to prioritize investments in the reconstruction of Manabí and sustaining other projects, as a consequence Yachay's funding was drastically cut and this was immediately felt in Yachay EP as it was the institution in charge of administering the funds, as well as the institution accountable for the advancement, or not, of the implementation of the project according to the pre-established phases. According to Yachay's master plan, the project was in the middle of its infrastructuration phase wherein all the necessary infrastructures to sustain the construction and eventual growth of all the city, the university and the technological park would be conducted. As a result of the cut in funding, Yachay EP's investment in the implementation of large infrastructures for the project was almost completely halted on its feet.

The main investment on key infrastructures for Yachay, such as roads and water supply systems as well as the buildings for the research clusters and some of the buildings for YachayTech became stagnated. This was the case, because Yachay, as highlighted across the thesis, was linked not only to its own emergent temporalities but also to the interests and motivations of Correa's government. For instance, the 2017 presidential elections were already showing their head around the corner, and they would not be postponed by any means, so it was paramount for Correa's administration to face those elections as strong, in electoral terms, as possible. This strength meant both popularity as well as, and connected to that popularity, being

⁷⁹ Take in account that these events happened in different dates, had of course different durations and effects.

able to showcase advances, if not fulfilled promises, around the government's emblematic projects, of which Yachay was the most significant one. In this sense, the context of the "perfect storm" had an implicit reference also to the upcoming elections, which as the next chapter will explore were critical for both Alianza País's long-term political strategies, as well as for similar minded governments in the region.

Nonetheless, these dimensions were not experimented evenly across Yachay EP. In fact, the tension generated between the temporalities of expectations promising a history-altering venture and the crash in actual economic investment in the project, flowed into the project mainly through the higher authorities of Yachay EP: Héctor Rodríguez and his personal advisors. Many of the lower-tier public employees were of course aware of the haste that surrounded the project, and they experienced it through different means like the intensification of work during certain periods or the critical reports on mass media outlets about the state of Yachay. However, their heads were not directly on the chopping block, they were not accountable to the central government or to the news outlets. Héctor Rodríguez was accountable to both, and because his personal relation with René Ramírez made possible his own designation as General Manager of the EP, and sustained his position within Alianza País, his stakes were even higher. His own relational infrastructures were a source of his own position, sustained his power, as well as shaping the vulnerabilities he had, not the least having to defend that positioning and having direct connections to very powerful governmental authorities like Ramírez and Correa himself. Rodríguez for example, had to negotiate and deal directly with the cuts of annual budget for Yachay in 2015-2016;

2016 was fatal, note that on December 28, 2016, at 8:00 p.m., at the time the last payments were generated from the Ministry of Finance, with Sandra Naranjo and Patricia Rivero we were triangulated on the phone, and forcing the payment of Invoices of 2015; 90 per cent of the debts of 2015 were being paid. This is in 2016, that is, the last working day of 2016,

so the company would not have to paint in red two years in the Fiscal Till. Such was the situation, tense, one in which people are going to visit you, it is one thing and the other, and the provider waits for you at the door of your house to collect your debt, they call you by the phone, in short, it has many things... (EP general management team member 2013-2017, personal communication, 2017)

Furthermore, this tension was not limited to receiving or not the previously committed economic resources, on the base of which the project depended for its development. Let us remember that the Public Enterprise was founded in 2013, by 2014 it had already been in charge of the inauguration of YachayTech, and it was itself going through an infrastructuring process both in regard to the construction and adaptation of the physical centres for operation for the public company, as well as the information systems and processes that would support its managerial operations. As I mentioned previously in the thesis, one of my first impressions of the EP was how unstable it was concerning its internal organization, the communication between areas and the temporal strain of how workers had to readjust their lives to in order to work in Yachay. The fact of not receiving funding also triggered a need to cover that absence with other activities, to generate revenue from other sources, and not let the company and the whole project fall into stagnation both internally and under the public eye. These elements were characterized ardently in one of my conversations with a high officer from Yachay EP:

Then, you can understand a little the desperation of the public company - this was at a certain time, I had not received funds from the Ministry of Finance for six months, and now what do I do? What do we start selling?, we start selling equipment?, we become an importer?, we start selling funeral services, that is, whatever. So, the public company was in a situation of vulnerability, it is like a child, who has to get nurtured and

grow - at the time he is born, he is extremely vulnerable, has absolutely no capacity for autonomy- then, it was like pretending that a six months old child should be already to be self-sustaining, it was making it more vulnerable. (Public Worker Yachay EP, Area of finance, personal communication, 2017)

It was clear that the pressure on the EP at an early stage was huge, and that elements from other settings travelled into the project through the public officials in charge, the public measures and how actor's dealt with the tension between expectations and achievements. Yachay was not just another project for the government; it was closely tied to the president who had called it many times the most important project of his whole government and a personal dream of his. In fact, without this personalization in the figure of Correa the project would have been very difficult to sustain and scale-up. Especially taking into account the centrality of Correa in Ecuador's government, the fact that it was a public enterprise dependant on ambitious public investment, and that it was fashioned from the start as ground-breaking both politically and economically. This meant, as I described in the previous chapter, having to deal with the resistance and disagreement of multiple actors, some more powerful than others, to the visions being mobilized and to the government itself. Nonetheless, the government expected that a "social pact" would be assembled around, and because of Yachay, because from their perspective "who could oppose to education and science" (personal communication 2018, César Montalvo, who worked in the presidential office). Nonetheless, this apolitical vision of science and education was not only proved mistaken with the appearance of many critics of the project from different perspectives. However, the government itself also denied it as Yachay was from the start embedded, and results were expected from this embedding, into the temporalities of Correa's government and its active connections with the long-duration dynamics of Ecuadorian politics. One of my interviewees explained how he perceived how little oxygen Yachay was granted to

breathe while trying to produce more oxygen for the “political process”, for the extended present:

Yes, political immediacy- I am not going to expand - it is a whole lot of difficulty around that, the environment of that political culture of immediacy that demands constantly from you, let's say, as a vicious circle from which you do not leave. In addition, on the other side, complemented with the perfect storm, that is, the vulnerability that the project had in respect to its promoter (the government) to leverage the resources necessary for the project to pass the first phase of breastfeeding. Have you seen the stories of other technological science parks, what is the point where they take off? We need to pass that critical point and we are saved... Ecuador, that is, Ecuadorian society and even more that of the political environment, has a political culture of immediacy with regard to the results of public action, not even just about, a governmental action. In the last ten years, we have experienced a constant maelstrom of plebiscitary processes, election processes, one after another, and each one of those processes demanded visible results before public opinion in order to sell that and generate a political capital that can give more oxygen to the process. So, let's say, the existence of a social pact is relativized because the occurrence of the pacts is very immediate. (EP general management team member 2013-2017, personal communication, 2017)

Besides of the above-mentioned topics, the fragment also points to the temporality of social pacts, of the commitments on which a project combining as many diverse actors and as demanding as Yachay depends on. Other authors have paid attention to the temporal dynamics involved in public projects that over time depend on attracting other actors from different ecologies, with their own motivations and

demands, to generate partnerships in order to develop new technologies and arenas while dealing with expectations in multiple ways (Campagnolo et al., 2019b). These authors highlighted how it is not always the case that “participants are equally committed to the rate and success of technological innovation.” (Campagnolo et al., 2019b, p. 982), this is especially true in my case as the expectations mobilized by the government apparently achieved commitments in the first instance, but as the commitment of the government itself to the Project was tested by the moving political, social and economic horizons many of these early commitments were not materialized, and others turned into franc opposition. This was in part due to the personalization of the project in the figure of Correa, who had enormous political popularity but also strong opposition from many sectors especially some traditional groups of the economic elite, social movements and the mass media. The evaluation of the promises was compressed into the present and the project was under constant vigilance both within the government, as it was a key asset and it was recognized as a focus for public scrutiny, as well as from the mass media and critiques. One of my interviews highlights the temporalities involved in these processes in the following fragment where he speaks about the early commitments and how somehow Yachay started becoming asphyxiated in the midst of it all:

So, a social pact is a symbolic signature, a social pact with science, technology, innovation. Just three years ago, on January 15, 2015, representatives of the chambers were signing, representatives of the decentralized autonomous governments, industrial representatives, academic representatives, the then rector of ESPOL, the newly appointed rector of the Central University and others. So, you expect those minimum agreements that have been reached - social pacts, non-intergovernmental pacts, social pacts for a given objective- to give you that oxygen to be able to aspire for long-term results. But no - you cannot ask the Reform of Higher Education to give you immediate results, it would be

absurd, the change does take longer and Yachay was given very little oxygen. (EP general management team member 2013-2017, personal communication, 2017)

Furthermore, these temporalities were present in Yachay, and shaped by Yachay's own development, through the relational infrastructures entangled in Yachay. In this sense, the general manager of the EP was a key actor. As I mentioned above he was selected as general manager precisely because of his position in Correa's and René Ramírez's relational infrastructures: he was trusted, he had the personal and not only the formal support of these authorities. But, this support had also demands and expectations attached to it. Héctor Rodríguez had to assist to periodical meetings with several ministers and the president where advances across all sectors were presented and defended by the ministers and their working teams, while other authorities evaluated the processes. These were meetings in which Correa would personally evaluate advances and examine failures and lack of progress, particularly on projects he considered fundamental. The advances or let-downs noted in these meetings would influence the esteem these people had within the government, and importantly on the eyes of Correa, who as discussed in previous chapters had enormous influence over almost all matters concerning the state (Meléndez & Moncagatta, 2017; Polga-Hecimovich, 2013), especially in regard to who was commanding the emblematic projects. I asked one of my interviewees about these meetings and the position of the actors representing Yachay in them, I was interested on how the demands imposed by the central government would end up shaping both the work in Yachay, the rhythms of the project and its different actors, as well as shaping the speed and the portrayals of advances achieved. In short, how through these meetings work was being done around the calibration of different temporalities, and around the evaluation of how the expectations surrounding Yachay were or not being achieved, and how these futures should look like implemented in the present. This is how he described these processes and how the complex temporalities involved in the infrastructuring of Yachay were collapsed into

the need to generate visible results in order to sustain the political process as a whole:

Interviewer: What was the president's perspective at the time on these issues?

Respondent: Well, he knew that - that is, we had seen enough, to understand that the process was difficult and long term, but also, he was very deeply plunged into that logic of results and I understand him. I was Assistant Secretary of Monitoring and Evaluation, and I was the stopwatch, the mainstay for those times to be met. More, I we had to adjust the times so, for example, in more global indicators, like the issue of distribution of wealth, and on the issue of improving indicators such as child malnutrition, etc., that they did not only comply with the rhythms of international averages, but that we surpass the best practices worldwide. And there, I think, let's say, in that desperation to get results, there could also be mistakes. (EP general management team member 2013-2017)

He continued, describing with concern the past through the eyes of the future, which was our present:

Of course, I'm being very self-critical because I think that if I could change something at that point in time - it would have been to tell Ecuador in the first addresses: "We are not going to see results of this, not until ten years from now, please let all of us know that we are not going to see results from this ..." and then, being able to advance... But, let's say, the political dynamics demanded that I delivered results, that I informed them through reports. You had to try not to be drowned by the pressures between factions so that you can have the possibility of enduring those ten years, but, that the vision

remains the same, that is, that it gets institutionalized a little ... but - If this other one is giving me results, this other one is giving me results, this one too, why aren't you giving results? So, I wanted to keep, not my position, I wanted to keep the vision of the Project. The held the others, I also have a result. (EP general management team member, personal communication, 2017)

Furthermore, this topic and the mentioned meetings became an interesting vantage point to explore the different relational infrastructures clashing and combining within the government. As already hinted in the previous passage of the conversation, Rodríguez found himself not only having to render visible the progressive materialization of the enormous expectations sustaining Yachay for the eyes of the president of Ecuador, but he was also an actor in the interior of multiple power struggles between different *factions*, using his words, that were taking place within the Ecuadorian state. From his perspective, this was a struggle between factions coming from dissimilar backgrounds and social groups, one faction's trajectory was more oriented towards the left and social concerns, while the other was connected to the private sector and was concerned with "productivity". This tension, in fact, was present in many other branches of the state and shaped Correa's 10 year government from within, along with the different, and sometimes conflicting, groups that had found in that government a common church but by no means a common ideology or interests⁸⁰ (Daza, 2018; Anahi Macaroff, 2018c; Anahí Macaroff, 2019). This is how Rodríguez described his impressions of these struggles and how they were present in the intragovernmental reactions to Yachay along with the temporal compressions the project had in its shoulders from the get go:

⁸⁰ In fact, one could argue that the figure of Correa, and more specifically the mode in which he governed by centring around him enormous influence, power and visibility, became the common node between these different relational infrastructures and the one avoiding them entering into full confrontation. This can be observed more clearly in the next chapter when Correa stepped down from the presidency and a fast implosion of his own party followed, the reconfiguration of the tension between the already present relational infrastructures was a key component of the process that followed.

Within the government, we had several voices of opposition. I think they were logical from the point of view of not knowing about the project, and also because of the defence of very specific interests, such as the case of Santiago León. Santiago León, who was then the Coordinating Minister of Production, said they opposed the issue, but due to a sort of internal friction between factions that clearly identify as factions of the Alianza País, but that were government factions that were in constant dispute. To put it that way, a more progressive wing with a more productive wing, if we can call it that, or a wing more in defence of the interests of financial intermediaries or commercial intermediaries, as in the case of the then Minister León. However, the opinion of the President of the Republic was deliberative, he believed in the project, he sent a series of questions, questions which were acquitted in several meetings, in the field visits ... Back then, we knew that the political capital we had at that time was not eternal and that we had to hurry the step to be able to develop a project that in other latitudes of the world takes, even, several generations. I do not speak of several years. What we tried was to put a tight schedule of four years from 2012 onwards to be able to arrive (to the next elections) with visible results before the public opinion and not only use that already existing political capital, but leverage greater economic and foreign investment support. (EP general management team member 2013-2017, personal communication, 2017)

In the passage, the informant highlights how a faction within the government opposed Yachay based on their interests and motivations; this shows on the one hand that the state and the government were not unitary actors, but entanglements of

different relational infrastructures, that were both shaping and being shaped by Yachay's trajectory over time. It also illustrates the internal tension within Correa's government that would eventually come to the forth during the administration of Lenin Moreno along with the clashes this entailed in respect to Correa's vision of both Alianza País and his plans for the future of the country. These elements will be discussed in the next chapter in detail. Moreover, it also becomes relevant in the passage the multiple political dimensions at stake in Yachay. Starting with the calculations around political capital that the actor mentions as fundamental in the process, as well as his own personal political and professional career that became coupled with the destiny of Yachay, and the ways in which changes in Yachay be them read as positive or detrimental, shaped the positioning of the political faction Rodríguez was part of, both in respect to the ongoing tension in the present, as well as looking forward to the future, and to the new government.

To connect here the literature on expectations I have built on for previous chapters with the literature on infrastructures, I draw explicitly on the concept of compressed foresight (Schyfter & Calvert, 2015; Williams, 2006). The concept of compressed foresight was raised to analyse the development of nanotechnology and the ways in which the visions of its future applications and societal effects where taken for granted and assumed as easily predictable both among proponents and analysts (Williams, 2006). Futures were assumed not only as discernible from the beginning, thus generating a deterministic understanding of innovation and technological evolution, but they ended up being compressed into the present for this same reason.

The concept was later applied to synthetic biology to analyse how promises mobilized by certain groups within the field generated expectations on the public policy level which in turn put pressure on the actors within the field to deliver advances and results in a short time scale (Schyfter & Calvert, 2015). More importantly for my analysis of Yachay, the authors argued that the phenomenon of compressed foresight developed along with the expectations generated by actors in the field, as these expectations ended up collapsing a multiplicity of potential advances into regimes of expectations mainly oriented towards economic growth. This hindered the required

investment and development of the infrastructure necessary to achieve the stabilization of the field in the short and midterm. Consequently, the pressure generated by the successful mobilization of the expectations ended up jeopardising the development of the field itself on the long run. This conceptualisation is useful in my analysis of Yachay in this instance as I argue that during this phase of Yachay its changing configuration was shaped by the mobilization of specific expectations, both the ones already in place and emerging ones, within particular political relational dynamics. As exposed, this process shaped the generation, the rhythms and the relations within which its main institutions developed their infrastructures over time. These elements are visible in the following fragment of an interview I conducted with a public servant who had been involved in the process of infrastructuring Yachay since 2010 at least:

Since 2015, in May, we already had a scandal⁸¹ and by then people already said: the project failed - it did not advance, and why, and so much money, and there are no results, and where are the patents?, and where is ... ? Only, in the fact of generating a patent, how long do you take, or how long do you take to generate a publication from scratch?, or how long do you take to attract an investment? How long does it take to generate habitability of a place?, as the gringos say, from the greenfield, starting from scratch. Yachay was not given the necessary time, the pressure was from side and side, we were prey to the immediacy of public opinion, but we also propitiated a public opinion that aspires to that. Then, the communication error was two-way, at the political level, suddenly feeding expectations that could not be reached with much, and then, we were prey to those expectations being oversized in a predatory political culture, so that a storm falls on us saying, - well, you didn't do anything -. Yes, but a

⁸¹ See the section about YachayTech in this chapter.

technology park is consolidated in 20 years - we've had four and with no money -. (Public Official 7, personal communication, 2017)

This I consider is a fundamental element in Yachay that has not been sufficiently addressed in the infrastructure literature: the meeting points between the infrastructuring processes, acceleration based on expectations and the temporal politics at different settings of the government as the central actor. This can be seen clearly in Yachay in several instances: buildings that are already in use with several unfinished floors; the public company that was required to execute a work of an incomparable size in the history of Ecuador while it constituted itself as an organization in terms of processes, hiring of personnel, habituation to the regulation to which they would be subject, etc. This can be verified in the National Comptroller Agency reports describing how there was no clear regulation of process division and responsibilities. In addition to that, it can be seen that in 2015, consultants were still being hired to define internal processes for the EP (DNA2, 2018a, 2018b). The university itself was inaugurated before being finished, with enough classrooms, accommodation or laboratories. Yachay as a city had people living there, among others students and teachers, without having the basic services planned for the city: a complete road system, basic services operating infrastructure, homes, among other elements. All this was happening in tandem with the shaping of relational infrastructures in multiple settings of the government.



Figure 32. A picture I took of some of the buildings being constructed as part of the research centre clusters and the technological park.

Linking this analysis with previous chapters, I argue that through the dynamics of the relational infrastructures connecting activities in Yachay to the president Rafael Correa, the temporal compression taking place in Yachay was twofold. Firstly, it was connected to the tension between future oriented expectations, the contingency of infrastructuring practices and the evaluation both intragovernmental and public of the provisional outcomes. Tied to the ambitious promises of economic development, innovation and scientific research embedded in Yachay. Secondly, through those relational infrastructures Yachay was connected as well to the historical dimension of expectations and the different pasts being actualized through them. I highlighted the importance of interpretations and mobilizations of the past in Rafael Correa's government in Chapter 3, and how these particular ways of understanding the past were connected to the futures promised by his government, particularly to expectations generated around Yachay as a flagship project that were critical in getting support and commitments to the project. I also highlighted how Correa's

political understanding and governing was shaped by the intention to sustain an extended present in which his party had political dominance and could mobilize sustained and durable normative and economic alterations with respect to how they understood Ecuador's pasts. The constant pressure to win elections and amplify what they called their political capital has been highlighted too, especially in connection to the long duration dimension of the historical experience of political dynamics in Ecuador as "a keen appreciation of the precariousness of power and the volatility of the present".

All this is to say that through the relational infrastructures converging in Yachay, beyond the formal organization of the EP and the University, the project was connected to both long duration pasts and temporary commitments to specific futures that related in complex ways to those pasts (think for example in the case illustrated in Chapter 4 around the Hacienda buildings and their reparation). Temporal compression then cannot be separated from the analysis of the timescapes (Adam, 1998, 2000) historically shaping Ecuadorian politics up to the present, how specific ways of reading the past are mobilized in the present and negotiated through expectations that also portray future capabilities and socioeconomic conditions. The economic structure of the country is important here, its high dependency to commodities such as oil and shrimp and their international cycles, and the way these shape political rhythms and demands, the temporality of state promises in this specific setting and what it entails for actors that have to attune to and negotiate with these temporal dimensions. This thesis does not aim to analyse these features in depth as it would require much more time, researchers and resources than the ones available for my research, but I try to point out how these dimensions appear in Yachay and are at least partially observable from the stories and the experiences of the actors in Yachay. I consider that these elements are critical when analysing a project of the dimension of Yachay in a country like Ecuador, a setting mostly overlooked in STS; and more importantly, that they are relevant for the actors and their experiences of pasts, presents and futures.

One case in which the entanglement of these temporalities and relations became particularly visible in the infrastructures were the buildings which construction was halted midstream due precisely to the sudden cuts in funding for the project. These half-built edifications had some vulnerabilities to time and weather that completed edifications would not exhibit, for example some of their structural components were exposed, such as the concrete columns and the slabs, which were not waterproof and thus were exposed to quicker deterioration. As a result, some of these buildings were not only unfinished, their materialization of futures frozen, but they also started to actively fall into decay, generating economic and symbolic costs that would pile onto the problems generated by the absence of funding. The public employees of Yachay EP tried to negotiate between, contest and adjust to the different temporalities coming together in Yachay, temporalities that were conflicting with destructive results in the project, but their efforts not always rendered positive results.



Figure 33. A picture I took during my visits to Yachay of two of the buildings which construction has stopped and that have structural issues related to the situation the previous passage describes. This is the view from YachayTech of the buildings, so the students and academics see this every day.

Visions of time committed to an understanding of time fixated with speed/acceleration, or Speedy time, provokes other times to collapse into markers of difference proper to swiftness: daily work and the complexities of attuning to multiple practices, actors and temporalities in the present collapse into “results” that announce the effective forthcoming of a desired future. This collapse of the future into the present, highlighted by the notion of compressed foresight, also leaves little time and space for practices that are fundamental in processes of sociotechnical innovation and sustaining infrastructures along with sociotechnical assemblages over time, such as maintenance, individual and collective learning, an appreciation of the contingency of expectations or practices of repair (Jackson, 2016).

In accordance with Jackson, I argue that tracing the different temporalities involved in the infrastructuring of Yachay at different moments in its life, enables me to understand the dynamics taking place there beyond narratives of visionary success or unqualified failure that have characterized both the public representations of the project, as well as the academic analysis of Yachay (Chavez & Gaybor, 2018; see for example Fernández González et al., 2018). Furthermore, I consider that these reflections are connected to a similar limitation in STS with respect to the understanding and analysis of bureaucratic times, particularly of these temporalities in the study of settings beyond the traditional and dominant spaces of research for STS (Furlong, 2014; Harding, 2016; Kreimer, 2019a; Law & Lin, 2017; Medina, Marques, Holmes, et al., 2014).

In this line of thought, the whole previous passages from the interviews can also be read through the call of authors such as Nayanika Mathur (Mathur, 2014) to study and consider bureaucratic temporalities beyond practices of domination, risk forecasting or technocratic management. Mathur argues that focusing only on these dimensions, which are unquestionably important, leaves out of scope a richer understanding of how bureaucratic actors constantly have to navigate multiple temporal orientations and diverse demands while trying to reconcile “contradictions within and between the timing of procedures and long-term temporal aims of state institutions.” (Mathur, 2014, p. 150). Instead, Mathur argues that in the setting of the

small Himalayan town in India, struggling to cope with the attacks of a man-eating leopard, in which her research developed “there was not just a singular temporal orientation, and also that the bureaucracy was not only orientated towards the future. Rather, there were various bureaucratic temporalities at play that looked to the past, the present, the immediate near future, and a long-term future.” (Mathur, 2014, p. 151).

This idea resonates with the intent of this thesis to extend the understanding of expectations as oriented only to the future by incorporating past orientations too, thus arguing that expectations can be understood as interfaces between both. Thus, expectations connecting the different dimensions of the social (Borup et al., 2006), the multiple political temporalities unravelling at the same time but with different durations, the natural rhythms specific to that ecology⁸², the activity cycles of the people certain actors work with, the many material and symbolic dimensions of infrastructuring, among others, compose timescapes in Yachay. These are both connected to what scholars from Critical time studies call “clock-time” and calendar time (Birth, 2012a; Wajcman, 2018), and are different to them, many times the greatest challenge being weaving these different registers of time together into narratives or visualizations acquainted to clock and calendar time such evaluations of anticipated advance and reports of progress.

The onus here is to highlight how analysing relational infrastructures as key components in sociotechnical assemblages and infrastructuring practices brings to the forth the complex constitution and stabilization of multiple registers of time on the form of timescapes in Yachay, and significantly, for specific actors and their vantage points in the ecology of actors. These timescapes shape the projects and are shaped by their development too, and through the specific relational infrastructures at stake, they are connected to other settings such as the central government and its own temporal demands in the midst of multiple unanticipated events, such as those

⁸² Think about the specific characteristics of the territory (such as weather, altitude, among others) that were prioritized when selecting the site for Yachay, and that are relevant for multiple human activities there such as agriculture and water management. I described these characteristics back in Chapter 4.

weaved together in the context of the “perfect storm”, which altered the configuration of temporalities and how actors acted upon them.

Moving forward, the lack of funding was momentarily solved in 2016 when the Ecuadorian government obtained a 200 million dollar credit from a Chinese bank to continue the implementation of Yachay. This was a sign of the turn in the national economy towards international debt as a source to sustain the government’s own operations and projects, especially with multiple negotiations with China’s government and Chinese investors. The funding situation would eventually change again when Lenin Moreno came into office after winning the 2017 elections by a short margin; the next chapter describes those processes in detail. The process of how YachayTech was implemented will be developed in the next section; I will highlight the new actors that came into the process and how this reshaped existing relations and expectations, along with the planned infrastructures and their implementation.

5.3. The University – from Research Experimental University to YachayTech: Relational infrastructures and the change of model for the university.

5.3.1. The transition towards Caltech influence influenced by events in Yachay EP

As chapter 3 of this thesis mentioned, the University at the heart of the project was initially known as the Technical University for Experimental Research. Later on, when the project was up-scaled into a city of knowledge and renamed Yachay, the University was known just as Yachay University. The design of its academic model was in the hands of Yachay EP and as with the whole project, at that moment in time, the IFEZ Korean team was serving as consultants for the design of the University. In fact, the plan was to have a reputed Korean scientist as the first head Chancellor of Yachay University. Nonetheless, this changed abruptly and the progressive distancing from the IFEZ team also implied a distancing from the model they had planned for Yachay University. This section explores this transition and introduces the Caltech team who would eventually become the Board of Trustees of the University as well as contributing in its renaming into YachayTech. The Caltech team entered the

Project at a time when the Korean team was losing prominence. Before explaining the Caltech group, I will discuss this loss of influence from the IFEZ team of advisors and how it was connected to shifts in the relational infrastructures of the project as a whole.

The Korean team lost prominence due both to economic factors and factors related to the struggle around the conformation of mediation relations between the different authorities of Yachay EP and other government strata. This loss of influence was directly connected to the decision taken by René Ramírez and Héctor Rodríguez to not to proceed with the contracting of the Action Plan, a more programmatic plan that would operationalize the master plan, which was suggested by the Korean team in order to continue the implementation of the City of Knowledge. Ramírez and Rodríguez decided it was too costly, and saw it as an opportunity to distance from the IFEZ team. The decision was justified under a specific reading of the elements at stake conforming the contexts of that moment in Ecuador when the downturn in oil prices was already beginning, and measures from the Presidency began to be taken to tighten the belt throughout the state. They were the highest authorities of the project: first, Ramírez was the highest authority formally as the leader of SENESCYT (and the direct connection with president Correa) and, second, Héctor Rodríguez was General Manager of the EP and the central authority in practice. Both pursued the same ideological line and were together in the past conforming working teams across various institutions and in charge of several of them, including both SENPLADES and SENESCYT.

Hence, this is why president Correa mentioned during our interview that Rodríguez was a trustworthy person who was close to René Ramírez and that this was one of the most important reasons to select him. As mentioned above, Rodríguez had been part of Ramírez's close group of advisors and circle of influence for a long time, and therefore he was seen as someone whom the government itself could trust to be able to read not only the needs of the project and its rhythms, but also to be attentive and aware of the political times and emergent associated requirements. Attention and attunement to those rhythms and times were vital. After several discussions with the

work teams, and against the recommendation of some of them (for example, Daniel Suarez and Ramiro Moncayo opposed this), Ramírez and Rodríguez decided not to hire the Action Plan. This decision directly limited the influence that the Korean team would have on the implementation of the project, as this influence was then limited to the previous conceptual design and the initial projection embodied in the master plan. Moving away from the Korean team and seeking, or agreeing, with other potential influences also had to do with limiting the influence of those members of the EP or SENESCYT authorities who served as primary contacts and mediators with the Korean team.

This was the case of Daniel Suarez and Ramiro Moncayo. Both were key actors during the project design and early implementation process (as I described in chapters 5 and 6 respectively) but with the creation of Yachay EP they began to lose influence, this process reached its peak with the decision not to hire the action plan as both had worked closely with, and influenced, the Korean team and the process of creating the Master Plan. Daniel Suárez worked for SENESCYT as a zonal coordinator of that institution for the Imbabura region, which allowed him to have a great variety of contacts with actors from all over the province and to be a well-known figure. Ramiro Moncayo had been Yachay's project manager before the public company was created, being the person in charge of much of the conceptual design and design of the public company itself.

Several of the informants mentioned that they expected Moncayo to become the General Manager of Yachay EP but that the central government decided to opt for Rodríguez who, despite having less experience and academic training on the subject of innovation, had a closer relationship, as mentioned before, both politically and ideologically with the central government. In addition to having the vote of confidence of René Ramírez and through him, of former President Rafael Correa himself. To get away from the influence of the Korean team in this situation was also to limit the influence of Suarez and Moncayo over the project. Both of them in some subjects did not align with the vision that Ramírez and Rodríguez had for the project. Suárez had a vision of the project quite embedded at the provincial level, where the

actors of the region should have a leading role and the main objective before the national impact was to generate links with nearby cities and attract economic actors from the Imbabura area, he would mediate much of those connections. That's were his expertise lied, and he had plenty connections throughout the region. Nonetheless, he thought that these connections were useless if there was not a strong attractor that could seduce all of these actors to come into Yachay. This attractor was the pulling force of the IFEZ team and the potential agreements with Korean enterprises they could mediate.

Moncayo was one of the connections with the private sector of Ecuador, and the interest of several private actors in the project had come and was sustained, through him. His vision was that the government should, as soon as possible, share the investment required for the project with the private sector, not only to generate productive links but also to share the mounting risk. Ramírez and Rodríguez had a vision that contrasted in some points, and they were not at all comfortable with private investment in the project, for them, the state should remain as the key actor. Not contracting the Action Plan also meant that on operative terms Yachay EP depended much more on the weekly planning and decisions taken on the go by the general managers, and much less on long term objectives evaluated and measured periodically consistent with the Master Plan. When I asked president Correa about the potential risks of not contracting the Action Plan after having invested heavily on the Master Plan, he responded that the structure of the public enterprise, in terms of hierarchical decision-making, could be sufficient: "that is why you have managers, to take decisions".

This kind of break with the Korean team opened, among other things, the possibility of intensifying other influences on the project. This was the case of influences for the model or design that the University would end up pursuing. The University was then called Yachay University or the Research University of Experimental Technology; this can be checked by reading the master plan and the proposed model for the university contained in it. Several actors were contacted internationally during the elaboration of the academic model included in the Master Plan; among them was Ares Rossakis

from CALTECH, who emerged as a potential consultant for the academic model, especially for the engineering related side of the University. Ares Rossakis was interested in the position but his interest was dependent on the involvement of one of his associates: José Andrade. José Andrade is an Ecuadorian Aerospace Engineer from Caltech who, from 2013 onwards, has become one of the most public faces from Yachay, especially from YachayTech.

José Andrade was already known within the government, as he had been awarded a medal of merit and had also been invited to join the Prometheus project. In José Andrade the authorities saw a man who could at the same time symbolize the scientific potential of Ecuador, being a young academic in an elite level University, who had a special recognition in his area and was highly valued by his mentors; but also, someone who could be considered an ally, and who understood the rhythms with which he would potentially have to work.

The actors when entering the project mobilize not only expectations but also their contexts, they set contexts into action, and these are shaped by their individual experiences and by the ecologies in which they normally move. Likewise, expectations also take material forms such as salaries, expenses accounts, benefits and status privileges). This is a particularly important movement in circumstances where actors have no previous experience, that is, where the knowledge that they have developed in the past must be applied to new situations where the success of its application cannot be assured. This topic has been discussed in the field of expertise, and in how experts in specific fields extend their expertise to participate in discussions in other fields with the same authority as they would in theirs. In my case, I am interested in the application of knowledge to new circumstances through its relationship with the expectations of the actors in question. In the case of Yachay, this is particularly important because several of the key actors: authorities and technicians of the EP, along with professors, deans, rectors and members of the management committee, had all previous experiences in their specific fields, but no experience in a project with that level of complexity, number of variables at play and political pressure both internal and external.

This process requires not only an adaptation of that previous experience to the current situation but also a justification or legitimation of why the experience is applicable and relevant to the current situation. In cases of new socio-technical configurations such as Yachay, this is important because this adaptation of the previous knowledge shapes the claims of the force with which the actors propose and mobilize future and past, and the expectations around them. In the case of the University, there is no doubt that the academic status of the members of the management commission served as the basis for gaining the trust of the president and René Ramírez who was then the head of SENESCYT.

It is known that José Andrade ⁸³ received the Vicente Rocafuerte Medal of Merit in Ecuador in 2011⁸⁴, and later on, “In October 2012 he visited the Senescyt representing CalTech to generate links with the Yachay project”.⁸⁶ And from there a relationship was generated that would allow the company of “scientific consulting” Ciacsecon S.A.⁸⁷, of which José Andrade was part, to be selected to carry out the consultancy corresponding to the "Development of a strategic plan for the administration, operation and application of the Yachay Science and Technology and Innovation System" for an amount of \$ 1,299,200 with signed contract on 05/13/2013 and with a delivery date “10 months from the signing of the contract”⁸⁸. Héctor Rodríguez as the “Manager of YACHAY EP” being the administrator of the contract. This consultancy consisted of two products, firstly, a proposal for the model that the Yachay University should follow for its development and, secondly, a model for the

⁸³ <http://www.mce.caltech.edu/people/jandrade> (last visited 13-02-2020)

⁸⁴ <http://www.mce.caltech.edu/news/370> (last visited 13-02-2020)

⁸⁵ <https://www.revistalideres.ec/lideres/jose-andrade-prodigio-ecuatoriano-ingenieria.html> (last visited 13-02-2020)

⁸⁶ <https://www.vistazo.com/seccion/pais/actualidad-nacional/un-millon-de-dolares-para-idear-yachay-tech> (last visited 13-02-2020)

⁸⁷ This company formally changed its corporate name and objectives in 2013 to pursue scientific research; previously it was devoted to engineering consultancy. This denotes that they did not have previous experience in creating academic models, not even close to developing models for knowledge cities. This opens the door for the strength of the company to be based on the expectations generated by the participation of the advisors or contractors whom they would hire.

⁸⁸ On December 16, 2013, the Creation Law of the YACHAY Experimental Technology Research University was enacted. Which means that the model was delivered and approved in less time than the calculated for the delivery of the product that was 10 months.

implementation -via relocation- of the research centres of Ecuador in clusters within Yachay the city of knowledge. Subsequently, another consulting firm had to be hired to adjust the proposed model to the Ecuadorian context. The consultancy suggested that the University should have a Board of Trustees at its head, in order to guide the process for the first 5 years; this Board would have to be constituted by high-level academics. After the consultancy was delivered and accepted, José Andrade and his allies from CalTech were selected as the founding members of the Board of Trustees and Yachay University became YachayTech. Therefore, Ares J. Rosakis, José Andrade and Guruswami Ravichandran became the three founding members of the Board of Trustees of YachayTech, all of them were tied to Caltech and had professional ties between them. To complete the highest council of YachayTech the government decided to hire Fernando Albericio, a Spanish scientist with a long and impressive academic trajectory, as the first Chancellor of the University. Albericio had experience working in Barcelonas' Science Park in which he played a critical role. Albericio would eventually move to Urcuquí and devote full time to his position in YachayTech, the other 3 members of the Board of Trustees never moved completely to Yachay. They travelled back and forth from Caltech every certain period of months, and this was a source of constant tension with both Albericio and the public opinion.

5.3.2. YachayTech in operation, the academics and the students

While Yachay EP and YachayTech share some common objectives being both part of Yachay as a project, the effective terms of their relationship became difficult to manage from early on. For instance, while initially the University was the project itself, later on as I have described in the third chapter of this thesis, the University became a part of a larger scheme, and its own objectives as a public University became tied with the completion and workings of the project as a whole.

Therefore, YachayTech's growth over time has been coupled to that of Yachay as a project and Yachay EP as the University even when inaugurated still depended on Yachay EP to finish the construction of YachayTech's infrastructures. Nonetheless, the university's trajectory has also been separate from the rest of the project as

YachayTech as any other public University has institutional autonomy and has to deal with the intricacies of running a higher academic institution in Ecuador. As mentioned before, YachayTech was the first element of the project to be inaugurated and to come into operation in March of 2014. The fact that YachayTech opened its doors so early meant that on the one hand, the university would have to translate the expectations that were pushing Yachay as a project forwards into a language that reflected more closely the academic objectives and potentialities the university had; while on the other hand, those expectations would be tested before long by the actors attracted to the project through different channels and different reasons (students, researchers, public servants, academic authorities, mass communication media). This was tied to the fact that going to YachayTech, be it for pursuing the next step in an academic career or to study an undergraduate program there, meant moving to Yachay, while it was still under construction.

Since its inauguration in 2014 YachayTech has constantly grown, it now has 1300 students, and in 2019 it will graduate its first ever promotion. Additionally, since its inauguration in 2014 YachayTech has already had six rectors. During this time, it has continued its development and has been able to attract the interest of new students in the degrees it offers. During the last 12 months, the student population has grown in such a way that they have run out of classrooms or enough housing for new students. Classrooms have been adapted in buildings that had not been designed for classes, but for bureaucratic procedures, students were given housing that was designed for investors, entrepreneurs or for members of the public service itself. The arrival of new students has put pressure on the infrastructural deficiencies of the university: laboratories, adapted classrooms, materials for laboratories, etc. Being in an age of austerity, the hiring of new lecturers has been very limited, instead, YachayTech has been required to give more hours of class to existing lecturers, and this has limited the time they have to conduct research. The University has moved closer to the rest of the higher education system of Ecuador, beginning to generate alliances with other local universities, on the lookout for cooperation links and

seeking to use the infrastructure of other universities while theirs remains in the works.

The reasons behind why actors are attracted to the project and decided to join YachayTech are different from those why they stayed: the initial promises and expectations are essential when they join, but afterward it is important to ask what makes them stay. Practices, legal structure, commitments to the future that increase the risks of leaving, specific goals that could materialize personal influence over the project, unexpected opportunities in the project now present in their horizons. The promised perspectives of high payment, high opportunities to access new labs, academic resources adjusted to their own requirements, students willing to learn, and lower competition, were all factors that attracted academics. Career decisions are vital for actors, and many took high risks based on the expectations generated by Yachay and YachayTech in particular. Initial contacts with international academics were made supported by personal connections of the authorities of YachayTech, and were supported by the prestige of the Board of Trustees and Fernando Albericio, YachayTech's first rector. One of my interviewees mentioned the following when I asked him why he decided to take the risk: *"if people like that are taking part in the project then at least some of it must be true"*.

The promise of societal impact was important too: being part of an enterprise that could change a whole country brings constantly forward to the mind the significance of each academic's research, and offered an opportunity to influence social policy and connect with a variety of actors outside of academia in ways that are normally difficult. Another attractor was the chance to mingle with other elite academics and start interdisciplinary projects in a context regarding both the country and the phase of the university itself that would facilitate this. YachayTech openly offered opportunities to build something new and the opportunity for academics to leave their footprints from the go: build schools, curriculum, and research programs from zero.

The University had a charm of its own, sustained by the academic figures that commanded it. Nonetheless, this was not the only factor drawing academics to YachayTech. International contexts were relevant too: many Venezuelan and Spanish academics were attracted in the beginning by the stability and opportunities they could not find in their own countries due to both academic structures (entanglements of practices and institutional arrangement) and socio-economic circumstances. A significant share of the 17 initial faculty members who signed for the University were from Venezuela and Spain. The current absence of promised infrastructure increases the pressure and activates dependency on social relations; many academics have to do research in borrowed labs from friends, colleagues (nationally and internationally), make new alliances with local universities (which is difficult because many of these universities show resentment towards YachayTech), change their research topics in order to fit what is available, or simply stop their research activities and focus on administrative and teaching work.

With respect to students, they are part of the first generations of the university, on whom the continually changing structure of the university is "tested" there is high uncertainty surrounding their professional opportunities: can there be any job for an interdisciplinary molecular biologist in Ecuador? Similarly, the hypothetical benefits of the "tronco común" (the common obligatory two years at the beginning of all the degrees offered by the university which aims to provide all the students with an interdisciplinary understanding of biology, geology, mathematics, and physics) are not clear to the students. This is especially true for those that compare themselves with other students from different universities who are studying similar disciplines: notice that the other students receive specialized classes of their discipline much earlier in their set of courses, as they do not have to take the compulsory two years of tronco común.



Figure 34. The students during the innovation week hosted by YachayTech. During the week the students made presentations of projects, they had been developing for months that were required to combine technical or scientific innovation to solve an identified social problem. I attended the event, and the students were very invested in the whole process, the diversity of ideas and the amount of work behind them was impressive.

Due to the constantly changing structure of the university in terms of the degrees it offers and schools, which is connected to the change in authorities and visions (6 rectors in the 4 years of life of the university), many students find themselves having to choose while they are already enrolled in 3rd or 4th semester a new degree. This happens because the degree they applied for when they entered YachayTech may no longer exist due to changes in the general orientation of the University or specific legislation or restructuring processes (for instance, the School of Innovation and Social Sciences was abolished in 2017 and with it the degrees attached to it).

By 2018 YachayTech had already 1200 students enrolled, an important number of lecturers and researchers from all over the world. As an interesting note the 4 scholars that started as Yachay's highest authorities: Fernando Albericio, Ares J. Rosakis, José Andrade and Guruswami Ravichandran were the only 4 public employees winning a higher salary than Ecuador's president. The University with its

national and international “excellence level” scholars, is expected to educate and construct a new elite of students who can become Ecuador’s driving force in the country’s academic, scientific and economic future. Ecuador’s government has already invested 400 million dollars during the period between 2010-2017 exclusively in the foundational material and social bases of the project which in the words of José Andrade “will benefit not only Yachay’s current students but all the generations that will come later” (Sociedad, 2015). According to the authorities, YachayTech has now passed “the consolidation period”, is now ready to get involved with the productive sector of the economy, and has launched “YachayTech’s year of entrepreneurship and innovation”.

Interestingly, YachayTech has already started collaborating in research and policy design with other Ecuadorian and international institutions. Some of these are: the INHAMI (the national institute for meteorology), a coalition with the Colombian government to develop an ecological protected area between the two countries in the Chocó area (C. del C.- Yachay, 2016) and the Ecuadorian Ministry of Risk (which is managing the reconstruction process after the Earthquake) (Andes, 2016). Likewise, YachayTech’s students have already been involved working with international research teams (Bermeo, 2016) and taking part in international innovation competitions (Sosa, 2016). YachayTech has managed to complete a 100% PhD population in their faculty members and the university has opened degrees in the following areas: physics, biology, mathematics, chemistry, nanotechnology, biomedical engineering, information technology, petro chemistry, polymer engineering and geology. By 2017 YachayTech had already 63 indexed publications and more than 93 on-going research projects, which has allowed it to be named in 2017 by the Nature Magazine as the 2nd most important University in Ecuador in terms of research (Web, 2016).

The next chapter will narrate the arrival of YachayTech’s fourth rector and how his management was connected to the new contexts mobilized by Lenin Moreno’s government that started in 2017.

5.3.3. The relation between Yachay EP and YachayTech

Throughout this thesis, I have referred to the project 'Yachay, the city of knowledge' simply as 'Yachay'. I have specifically referred to the public company in charge of the construction of the project as 'Yachay EP' and to the University as 'YachayTech'. I have done this voluntarily and with an objective in mind. I do this to avoid confusion and be clear with the descriptions I do. Media in Ecuador has constantly equated the EP with the University and has used the terms interchangeably rather carelessly, this has resulted in problems on public representation of the 2, surrounded by controversies and the intent from both institutions to draw a clearer distinction between them (See for example Hora, 2018; Rivadeneira, 2018; Rodriguez, 2018; Telégrafo, 2017). Even ex-president Correa was aware of this tension and during our interview, he conveyed that he could not understand entirely what the reasons for the dispute were, nonetheless he acknowledged that this tension between the two institutions had been one of the biggest problems of the project until that point in time as it generated frictions that had public resonance.

The University and EP are different institutions, with different missions, different action plans and, importantly, they respond to different regulations. Yachay EP's purpose is to build the whole project and provide the necessary infrastructure for YachayTech; it responds to the regulation of the National Coordinator of Public Companies of Ecuador; whereas the University responds mainly to SENESCYT (the national secretariat for superior education, science and technology). Among other factors, this confusion between both institutions has generated scandals from each one being generalized or directly translated to the other. From very early there has been a tension between both institutions that has conducted to the aforementioned intent to separate more clearly one from the other under the public eyes.

During my investigation, the strong tension between the public enterprise and the University made it difficult to navigate between the two institutions and actors from each one of them had very critical opinions from one another, with some exceptions. Naming one with an actor of the other could spark certain apprehension. On the one hand, from the perspective of actors from YachayTech, the public enterprise had never been able to acknowledge, and act accordingly, to the fact –from their perspective- that the University was the “heart and motor” of the whole project and that without it everything else was expendable. This implied that the EP should have been focusing on completing all the infrastructure and services needed for the University rather than extending its investment to multiple focus points and continuously postponing many infrastructural needs of the university (such as research labs, student residencies, more and better fitted teaching spaces, among others). On the other hand, from the perspective of the public officers working in the EP, the academic actors from YachayTech could not understand, or resisted to accept, that the University was just one of the elements of the city of Knowledge and that it was as important as any other of the other elements such as the health services infrastructures, the business park or the innovation centre “Innopolis”. This tension was intensified by the fact that the Public Enterprise started getting less resource to invest in the project from the central government in 2016 during the “perfect storm” and the institution had to spread less butter on the same amount of bread in a context in which expectations around Yachay after the inauguration of YachayTech in 2014 were in an all-time high.

In fact, when I started my research I applied for institutional approval from Yachay EP to conduct my research, this process took me around 2 months from initial contact to having a letter signed by the general manager of the EP in which he confirmed the institutional approval of Yachay EP to conduct my research in the whole extension of Yachay the city of knowledge. Accordingly, it was an unpleasant surprise being rejected by the University when I approached them to conduct my observations and interviews. The authorities argued that they did not accept the mentioned approval letter from Yachay EP, that YachayTech had its own legislation, and that if I wanted

to investigate in YachayTech I would have to go through their own research approval process. Process that would eventually take me several months to complete.

This tension was, interestingly and maybe paradoxically, generated in part from the public representations of the project that were occurring externally. Authorities from the EP considered that some of the resistance that the project as a whole was having come from the opposition of certain private and public universities to YachayTech and the amount of investment required to create a new university with those standards, instead of using those funds to strengthen the existing higher education system, among them those same universities.

It was clear that the tension on the present between both institutions was shaped by tentative observations about the past of the project, and about how the public vision of Yachay's futures was menacing for other actors from different spheres. This tension would not disappear with the arrival of the new Chancellor of YachayTech, neither with the entrance of a new administration for Yachay EP in late 2017. The next chapter will describe these two under the light of the changes flowing through the whole of Yachay and Ecuador more generally.

5.4. Chapter final Reflections / conclusions

This chapter has focussed on the analysis of the dynamics of both Yachay EP and Yachay already in operation from 2013 and 2014 onwards. Based on the data gathered during my fieldwork I have tried to both empirically reconstruct the processes that happened during this period in the life of Yachay as a project, as well as to analyse those dynamics using the theoretical tools chosen for this research. This chapter has brought to the fore how non-governmental actors became interested, were attracted and committed in different ways to Yachay. I have analyzed these elements by inspecting the different temporalities at stake and how these

temporalities, expectations and beyond, interacted with the infrastructuring process of Yachay at this stage. Across the chapter I developed in greater detail the proposed concept of relational infrastructures that aims to connect the materiality of infrastructures with the actors' wider commitments, and the power dynamics associated with these, that are both shaping and being shaped by the infrastructures unravelling across time. The idea is to be able to grasp how individual experiences of time and actor's agency in sociotechnical change converge with, shape and are shaped by social dynamics that are neither fully personal nor fully institutional. Rather relational infrastructures are constituted by both formal and informal relations between actors developed in one setting but that are able to travel to other settings with the actors. This is, more or less stable relations constituted at multiple spaces and times simultaneously, through different rhythms and that serve as basis, as foundation, for other relations and actions. In this sense, it tries to analyse the multiple times converging in an infrastructure which are connected to, but cannot be reduced to, the materiality of the infrastructure itself and the present of the infrastructuring process. These reflections also draw on the work of scholars around social temporalities, for example on the idea of how individual times draw on other temporal dimensions, such as natural temporalities and collective regimes, but cannot be reduced to them (van Tienoven, 2019)

As well as with theorists from the BOAP approach who insist on analysing actors not only in respect to the immediate setting of action, hence to the limited observed solitary entry points, but also in connection to their own extended trajectories and the ecologies of which they are part. Including the uncertainties at stake and their limited perspectives of the arenas in which they encounter other actors and establish, or not, stable relations.

Across the chapter, I have shown how these relations have shaped both Yachay EP and YachayTech, focusing on specific clashes of visions: the first between two groups within the administrative ranks of Yachay as a project, and the second between the academic authorities of YachayTech. The next chapter will extend both the narrative and the analysis to a different moment in the history of Yachay: the reconfiguration

of the project as a whole that unravelled after the 2017 presidential elections, through which Lenin Moreno became elected president of Ecuador. The emergence and progressive strengthening of a very different mobilized context connected to a reading of the project that openly confronted the one represented by Rafael Correa and his government.

CHAPTER 6. Yachay before and after 2017 elections

6.1. Introduction

This chapter will focus on the last section of my fieldwork in Yachay from December 2016 to April 2017 and what has happened in the project since. The chapter will focus on how the transition between Rafael Correa's government and the government of Lenin Moreno both shaped, and was shaped-by, Yachay at an institutional level and through the experience of specific actors. The narrative will focus on describing how Yachay was down-scaled from its planned 4260 hectares of intervention area into a much smaller project with narrower ambition. This will be observed in both the changes in the scale of the project performed by Yachay EP's new administration that started managing the project when Lenin Moreno came into office, and by the announcement of the closure of Yachay EP in 2021 as a symbol of the change in the dominant context and the associated readjustment of the expectations surrounding the project into the future. This process would leave the project with a similar scale as in its very early beginnings: a technical university. In that way, giving a full round-about to the process of up-scaling (see chapter 3) and downscaling (this chapter) that Yachay has experienced across its life and that I have tried to portray across the thesis.

I will do this by following the dynamics of Yachay before the elections of 2017 that would enable Lenin Moreno to gain the presidency, and by showing how the dominant context changed. First, through the anticipation of this change present in a controversial event that took place in Yachay in early 2017. Second, by analysing how conflicting visions between governments ended up in the mobilization of different contexting⁸⁹ strategies and the eventual readjustment of expectations both about Yachay and for the country more generally. By describing the new set of actors

⁸⁹ Here I acknowledge the work of Kristin Asdal (Asdal & Moser, 2012). Her work problematizes the notion of context aiming to study it more as a process than as a stable entity. Although similar, my use of the concept mainly refers to its connection to expectations and the temporal dimensions of contexts, as it will be explained in more detail throughout the chapter.

coming into Yachay EP and YachayTech and how the dynamics of infrastructures readjusted accordingly. This chapter connects the changes in the expectations surrounding the project grounded on actualizations of the immediate past and near futures by specific actors. Moreover, coupled to these transformations, it will address the mobilization of the context of crisis by the new government, which triggered significant effects in both institutions, in Yachay as a project and in Ecuador's government more generally.

Accordingly, the chapter will have the following order. First, I will zoom into the analysis of an event, the announcement of an electric car factory to be implemented in Yachay with enormous investment. This will be an observation point from which to tackle the dynamics occurring in Yachay before the elections and explore how actors positioned themselves and Yachay within the uncertainty that marked the elections through an attempt to reposition expectations. Then, the argument will follow the early actions of the new government coming into power and how Yachay both shaped and was shaped by the interrelation between the departing government and the new government locating themselves within the economic and political landscape. In this section, I will analyse "crisis" as a context in action positioned by the new government as a way of actualizing expectations around both the previous 10-years of government and the near future. Accordingly, I will describe how both the EP and YachayTech were connected to these changes and how actors within the project acted upon the new scenario. Finally, the section will end with the chapter's conclusions by providing a synthesized analysis of the dynamics at stake at that moment in time in Yachay, and analysing what this could mean from an STS perspective.

The last 18 months have been very convoluted for the project. After the change in government in May 2017, all the managers from the Public Enterprise were replaced, and a special examination from the National Comptroller Agency over the previous administration of Yachay EP was one of the first initiatives of the new Government. Additionally, the arriving president Lenin Moreno openly criticized the project in various public appearances; he cut Yachay's economic and political resources and

more recently, he announced that Yachay EP will be closed in 2021 as part of an “austerity economic plan” being rolled out throughout the entire state. Furthermore, after the ordered examinations, the national comptroller agency declared criminal responsibility against some of the previous administrative authorities based on a critical evaluation of a variety of issues both with the construction of crucial buildings of the University and the not yet inaugurated future business park, as with breaches of required public legal processes. In a couple of months, both what was foreseen from Lenin Moreno when he was elected new president, as well as the importance that Yachay would have in his government changed radically.

The expectations about the future of the project have outlived the dominant contexts in which they were formulated, both the government and the economic situation that characterized the emergence of Yachay as a project have radically changed. The horizon has now compacted and the narrative of crisis flies around once more after the unusually long lifespan of Correa’s Government. This tension between the initial expectations and the current dynamics continues to challenge the project and permeates much of the public imaginary around it. This chapter will follow this unexpected transition and the effects that came later for actors, practices and the institutions compounding Yachay. The next section will focus on the transition between governments through the description and analysis of one event in which we can already see some of the tensions at stake and how actors were already readjusting to the potential outcomes of the elections that at the time were unforeseeable and created uncertainty in both the project and the government.

Before that, I want to state that this chapter includes more changes in narrative voice than those present in previous chapters. I have tried to combine a “bird’s eye view” perspective that captures the changes of Yachay across time, with more focused descriptions of actor-centred observations and experiences, as well as my own experiences and descriptions in the form of fieldwork-journal annotations. This change in narrative voice goes hand in hand with changes in the zooming in or out of the simultaneous trajectories unravelling with multiple durations, from actor centred emphasis to processes addressing institutional dynamics. These intend to mirror my

methodological approach which is enrooted in the BOAP approach, as well as communicating my analytical reflections about the situatedness of actor's perspectives, contexts and expectations.

6.2. Tesla in Yachay? Immense expectation and immediate breakdown in the face of national elections

6.2.1. The importance of visits and events for Yachay

The Friday before the event I was at the Yachay EP offices in Urcuquí, I had been doing interviews all day and watching the movements inside the offices. The presidential elections were approaching and there was a climate of restlessness between the workers and the high authorities with whom I could talk. In the elections, the candidate of Alianza País, the ruling party, was Lenin Moreno and his closest adversary seemed to be Guillermo Lasso, a man who is closely linked to the banking conglomerates of Ecuador and who had been the minister of finance during the government of Jamil Mahuad (1998-2000) before the breaking of the Ecuadorean bank system in 1999 that led to the dollarization of the national economy. The elections were very tight and it was not clear if Moreno would win and even more what could happen with Yachay if Lasso won. It was speculated that they could privatize the project altogether or deliver it to some private group that would take away the public role it had had up to that point.

This resulted in a constant tension surrounding work in Yachay, because in a few weeks, the orientation the project had had until then and the central importance it had for the Government could change radically, and that also meant on a personal level that many of the jobs were at risk. Another source of uncertainty, but less marked, was what would happen to the general manager and the managers of the different branches of the public enterprise of the project if Lenin Moreno won, would the new government follow the same line? Or would Moreno seek to place actors who were closer to him and his circle of trust in the management spheres? That

Friday some activities were being organized in Urcuquí and in the communities, however, there was something different: there was a rumour that on the next Monday or Tuesday there was going to be an important event, an announcement or inauguration, so important that Rafael Correa himself was going to go to Yachay for it. However, the detailed information seemed secret, almost none of the workers with whom I spoke knew what was going to happen and they told me that only the General Manager and his advisors knew what it was.

Correa's prior visits to Yachay had marked essential and significant milestones for the project, for the communities and the expectations at stake at various levels. The visits were not frequent if by frequent one understands monthly or repetitive, as Correa had several projects in motion throughout Ecuador and regularly travelled across the country. These travels can be corroborated on the itineraries that the president briefed weekly on the Saturday televised reports to the nation. This meant two things: Correa's visits became key moments to demonstrate progress to the president and in this way, show the efficiency that managers had had to execute the project. This, in its turn, had an impact on the personal careers of these actors and their position within the government both in the present and with an eye to the future. As mentioned in Chapter 2, there was a very intense and strategic interaction throughout Correa's government between infrastructural projects that embodied the increase in public investment, and the associated intent to sustain an extended present both on the base of the success of these infrastructures, as well as serving as the mechanism through which legitimacy and public support were achieved and thus the creation of more ambitious projects were made possible. Yachay was in a way, the highest expression of this tension.



Figure 35. Rafael Correa in the centre of the image during his first visit to the site of Yachay. He is accompanied by René Ramírez on the left with a black t-shirt, the national secretary of SENESCYT at the time and a very important figure for Yachay as mentioned in previous chapters, and other governmental authorities. (Senescyt photographic record)



Figure 36. The older adults of Urcuquí welcome president Correa to the town. Correa inspected the infrastructure and in future visits he evaluated the advances. (Senescyt photographic record)

These demonstrations were designed to be in the line of showing progress but not any development; instead, they were expected to show specific changes in the space in a way that was resonant with the expectations generated by and for Yachay. That is to say, that a new building was not only one more infrastructure inaugurated for the University but also that it should be linkable to the proposed changes in the productive matrix. It should embody the future in some way, make the promised

future at least partially visible. That would render a distant future actionable for public speeches, to mobilise more resources and to show advances to the general population.

However, this also had another side, the side of the president and his team, as they were, in those instances, able to observe or witness the project with their own eyes and verify the information that was given to them, in the form of formal or informal reports, with what was happening in the field. It was an opportunity to measure the expectations that he had been given, by the Yachay EP managers, with the level of execution that he considered the project should have and the timelines that had been set accordingly. The visits coincided with milestones of the project planned in advance such as prestigious inaugurations like YachayTech's inauguration, when authorities from both the government and the University gave ambitious speeches.

Events are key for weaving and concatenating historical trajectories such as the development of Yachay with that of a personal career and the longer history of Ecuador. This does not happen only at the discursive level with speeches or statements but also materially with the presence of authorities, the signature of legal ties, the generation of institutional memory, and the deployment of institutional and national symbols. The presence of ex-president Correa, for example, in Yachay events also had the function of solidifying the promises: give them body and figure, give an identity to many promises that would otherwise be anonymous.

Therefore, the presence of the president also had the effect of embodying and somehow implying a level of accountability for Yachay's expectations. While conversing with the leader of one of the communities that lie within the perimeter of intervention, she told me that the president's first visit to the project was the marking point when they felt that what they were being told and what was happening was true. It became all "real" when they saw the president arrive at Urcuquí and step out of the vehicle to greet the people. This was so, because through the figure of Correa,

and the associated symbolic apparatus and narrative infrastructures, Yachay's strange and uncertain futures projected 45 years ahead were linked with the present, with his figure as president and with what the government of the previous 5-6 years meant for the people.



Figure 37. Ex-president Correa in his first visit to Urcuquí when Yachay as a project was publicly announced, he is surrounded by the people of Urcuquí when entering the town. His first visit crystallized the expectations surrounding the project, as people were able to tie them to his figure and what they already thought of his government. (Yachay, 2016)

From the point of view of the Yachay EP public workers, these were moments of high tension where work was intensified to the point that they did all kinds of work outside their regular jobs. They had to perform other activities, as needed, from sweeping floors to helping paint houses or planting plants and trees. The working hours were also extended before these visits because the authorities preferred not to postpone the milestones mentioned above when they saw that they would not manage to do so. They would instead intensify the work practices to meet those planned dates, or provide an image as close as possible. Thus, from their perspectives, not failing the

president and the highest authorities who came in those visits was an important priority.

6.2.2. The event: RedTech and a 3 billion investment in Yachay

Having a clearer image of what the visits entailed, we can return to the Tesla event. On Friday the 10th of February 2017, there was a lot of hustle and bustle not only in Yachay's offices in Urcuquí but also among the people who worked in the Quito offices. The higher authorities had told them that the next week there was something big happening in an event in Yachay and that it was so significant that the president himself would be assisting to the event. It was quite possible that the Quito workers would be mobilised from Quito to the offices of Urcuquí to help prepare the event and to contribute to form a prominent presence.

On Friday, I returned to Quito in the afternoon bus that left at 5:30 and was arriving in Quito around 8-30pm or 9 pm. However, that weekend I travelled with my family to the province of Imbabura, and they wanted to see Yachay for the first time, so on Saturday afternoon, we took the route from Ibarra and arrived at Yachay EP's offices around 4 pm. I was surprised to find that for a Saturday afternoon there were many cars parked outside the offices at the former San Eloy Hacienda where the main Yachay EP's offices were located back then. While we were walking with my family around the surrounding areas, we met several workers who told me they were occupied to their necks getting ready for the critical event planned for Tuesday as it was already confirmed that the president would be there and they needed to get everything ready for him. I want to highlight that this was a week before the national elections in which the whole continuity of the government would be at stake. Therefore, the visit from the president as well as the event were even more urgent and demanding as the future of the project itself could be in jeopardy if one of the candidates of the opposition won the elections and this would probably be the last public event conducted in Yachay before the elections. Whatever happened could shape the

public understanding and perception of the project, and its connection with president Correa and associated authorities, towards voting.

One can analyse the time before the elections as a period of internal restructuring of Alianza País, especially under the light of the current drastic divisions that emerged publicly in the party after Lenin Moreno won the presidency. We can reflect that at the time, the political careers, and future positioning, of Rene Ramírez and Hector Rodríguez within the party and the government were at stake⁹⁰. Moreover, they wanted to demonstrate how the model they decided to pursue in Yachay and their associated leadership, could finally show its returns. This gives a sense to diverse agendas and interests that were at stake at the event. One could argue that the intention of the actors promoting the event was to define the way Yachay as a project would influence or not the upcoming elections, how Yachay being portrayed as a rotund success would influence the way Ecuadorians would vote or not for Alianza País's candidate. This is, the trajectory and narrative around Yachay as a constitutive context of the upcoming elections was at stake. Here I draw on Karin Asdal's work to highlight how all these trajectories develop hand to hand. They are enacted together and mobilised as a specific context that is not a stable entity but a stabilized reference open for dispute:

I argue that context and contexts are not something which simply surround the text or within which the text is embedded. Contexts instead actively take part in enacting, producing the text, that which stands out as the relevant issue. It is in this way, I suggest that we understand contexts to mean situations, combined with a little help from actor-network theory and the notion of collectives and versions of society. (Kristin Asdal, 2012b, p. 382)

⁹⁰ In fact, later that year after Lenin Moreno won the presidency René Ramírez confirmed he would not be part of the new government's bureau (Web, 2017b) and Héctor Rodríguez was replaced as the General Manager of the EP (Rosero, 2017).

The event took place on Tuesday the 14th of February of 2017 in Yachay-Urcuquí (Web, 2017a), it took place five days before the general elections (Redacción, 2016). I witnessed the event which developed in one of the conference rooms of the *Instituto Superior Tecnológico 17 de Julio* (Advanced Technological Institute 17th of July). There were TV cameras all around, authorities from both the EP and YachayTech were there along with some national authorities such as René Ramírez, national secretary of SENESCYT, Silvia Vallejo, executive director of ProEcuador⁹¹, and Jorge Martínez who was then the governor of the province of Imbabura where Yachay is situated.

The vox populi was that president Correa was trapped in Quito's airport due to weather conditions and waiting to catch a helicopter to arrive to Yachay, but at the end, he did not make it and sent René Ramírez instead. In the event authorities from Yachay, specifically Héctor Rodríguez and René Ramírez representing SENESCYT, announced the private investment of "3 billion dollars, 3% of the country's GDP" (Sociedad, 2017) from a mixed venture company named "Red Tech NikteslaCORP Cia. Ltda" (RedTech) to construct an electric car mega-factory within Yachay's TechnoPark. It was also announced that both IBM and Tesla would be involved in this venture through RedTech and that the cars would be using Tesla's technology. Furthermore, the mega-factory would be developing not only electric cars, but also "motors, electronic components and graphene superconductors" related to "sustainable mobility" (Sociedad, 2017).

⁹¹ A government office that is devoted to promoting Ecuador's products in the international market and attracting potential investors.



Figure 38. Pictures of the event, the logo of HP was flagged as a supporting symbol for RedTech's legitimacy. Additionally, Ecuador's national anthem was chanted at the opening of the event as the country's flag was projected behind the authorities. On the left a visualization of the electric cars that the mega factory was expected to produce was displayed during Justin Perry's speech. (El Telegrafo Web, 2017a)

The association of Tesla itself to the event was outstanding and the electric-vehicle component was connected to the achievement of both *buen vivir* as it resonated with the environmental dimensions and concerns that characterized the paradigm. As well as with the government's narrative of pushing the country towards a transformation of its economic matrix as the announcement indicated Ecuador and Yachay were suitable sites for that type of ambitious investment, research, development and production of cleaner technologies. Hence, showing a transition in motion and putting Yachay as the site where the transformation could be observed and the locatable centre from where the transition would roll out. Interestingly, ex-president Correa went a step further by proposing that Yachay not only should avoid seeking to become Silicon Valley but that the very idea behind Silicon Valley is already expired, and that, consequently, Yachay should look to other materials as the central metaphor for its development:

Silicon Valley is already a concept of the previous millennium.
The vision, the dream and the challenge must be to transform the
wonderful valley of Urcuquí and "Yachay", the City of Knowledge,
into the Graphene Valley.⁹²

The use of graphene as a focus for expectations about the future investment and the mega-factory was then not only connected to the international fame of Tesla but also to the government's own narrative of overcoming the Silicon Valley model and

⁹² <https://rutakritica.org/2018/10/14/yachay-y-la-piel-de-dios/> (last accessed 12-02-2020)

embodying in Yachay a way of doing so. Once again, expectations regarding a potential future for both Yachay and Urcuquí were connected to actualizations and reconfigurations of narratives and external references that had been part of the project, and of the wider mobilized contexts in action, in the past. The idea of overcoming the Silicon Valley model was part of the conceptualization of Yachay since the beginning and was connected with the leading role the state would have in Yachay's design. This leading role was contrasted with the public perception, not accurate (Mazzucato, 2013), that Silicon Valley was mainly established through private investment and private innovation ventures.

The RedTech investment aimed to show that Yachay could not only fulfil the early promoted promises and expectations, but also it could do it in line with the pursuit of the ideological principles of the government, particularly of the actors that were commanding the project. This is clear in the words of Justin Perry one of the CEO's of RedTech interviewed shortly after the event:

After a conversation with ProEcuador, we saw in Yachay City the of Knowledge the opportunity to incorporate projects aligned to policies that improve, not only living conditions, but that can be transformed in the future into practices and technological developments that can change the planet. Yachay, without a doubt, is the space where we can generate all this, a city that from its idea contemplates the development of scenarios that seek to improve living conditions and contemplate the development not from finite resources, but from the infinite resource: knowledge. (Sociedad, 2017)



Figure 39. Pictures of Héctor Rodríguez, general Manager of Yachay EP, signing the contract and giving a speech to all the attendees. The auditory was packed and a variety of media were present. Figure 40 Source (Web, 2017a)

From the approach highlighted across this thesis, it is very interesting to observe how through this event (an extraordinary moment in collective time) actors from Yachay and from the higher authorities of the then government intended to sew together several temporalities with dissimilar durations. Firstly, the RedTech investment would mean for Yachay an undoubtable sign of progress, an achievement of the kind that the press and the opposition so fiercely demanded from the project, and in a way a symbol indicating that the promises and expectations generated years before by the government authorities could come to fruition. Secondly, and at the same time, this success could be seen as a milestone in a process with a longer duration: the whole Correa administration, the lines of public policy pursuit during those 10 years that shaped the Ecuadorian state and the strategic ideological positioning they had with respect to both Ecuador's past, the international arena and Ecuador's future in that arena. Thirdly, let us not forget what this meant for the actors themselves, especially

for René Ramírez and Héctor Rodríguez, whose personal professional and political careers were on the line.

In a few words, through the event temporalities connecting actors, practices and institutions were tried to be stitched together seamlessly to constitute a successful referent, a victorious context:

“The construction of the plant will take around 3 years and will occupy 400 hectares in its maximum part of the City of Knowledge. The multiplier effect of the project includes the creation of a network of Ecuadorian suppliers that will supply the manufacturing needs of this industry. It should also be noted that this project goes hand in hand with various socio-economic and environmental projects. In the first year, RedTech estimates an investment of \$ 25 million, just for studies and the preparation of the first prototypes. The factory will generate around 5,000 direct jobs and 12,000 indirect jobs in its maximum production, which will be in the fifth year of operation.” René Ramírez, during his speech at the event (Sociedad, 2017)⁹³

⁹³ These elements can also be analysed in the discourse of the authorities that took part in the event. The whole event can be seen recorded here: <https://www.youtube.com/watch?v=HFrshmhUkTc> (last accessed 10-12-2019)



Figure 410. René Ramírez, Héctor Rodríguez and Justin Perry showing the signed agreement, on the background we can see Yachay's logo displayed with RedTech's logo. Source (El Telegrafo Web, 2017a)

6.2.3. Expectations breakdown

What followed the next hours, and especially the next day, was completely unforeseen for me. That night I slept in a small hotel in Urcuquí very near Yachay. Authorities from Yachay sometimes slept there too when they could not go back to Quito or needed to be very early in the site. That night, the manager of the EP innovation area, stayed there and I could hear him texting and receiving phone calls almost all night long, he seemed restless. Something was brewing. Some news started coming out in social media with respect to RedTech: the enterprise had been constituted less than one week before, the capital of the company was less than 10.000 dollars, the CEO had no previous experience in such ventures, the electric car designs presented during the event had been improvised a couple of hours before, Justin Perry had been searching for a job desperately a couple of weeks before, and the list went on. The central matter was that the whole 3billion announced investment seemed by the hour more and more a mirage.

In response, Redtech created social media presence and made a number of public appearances trying to calm the waters. They created a Twitter account⁹⁴ that was opened the same day of the announcement, a web page that remains in construction until today⁹⁵ and Justin Perry, the CEO of RedTech, was promptly interviewed in El Telégrafo, a public daily newspaper with wide national audience, about the investment and the future capabilities it would generate (Sociedad, 2017). Even so, there was no going back. The scandal soon took propulsion and in a matter of days, the investment passed from being “the most important private investment in the history of the country” to a farce covered in a variety of social media (Chavez & Gaybor, 2018). Here is a fragment of my field journal written two days after the event:

“Today the aftershocks of the scandal that broke out yesterday regarding the contract signed with RedTech started to be felt. During yesterday afternoon, articles and small investigations of people who inspected the owners of the company, their website, the dates of constitution of the company and the experience of both CEOs in relation to the extravagance of their ambitions began to be published on Twitter and Facebook. The previous day the project was presented as if it were immediately accessible, and they only needed to sign the contract to launch it, reach out and take it. Huge statements were made, like it being one of the most important days in the history of Ecuador, that in the signing itself of the contract with RedTech it was shown that the economic model of the government was viable even with respect to international capital, stepping outside the crudest neoliberal measures. It was a celebration of victory for the project and for the government; the published tweets and fragments prove it.” (16th of February 2017, personal field journal)

⁹⁴ https://twitter.com/red_techec?lang=en (last accessed 8-09-2019)

⁹⁵ <http://www.redecua.com/> (last accessed 10-04-2019)



Figure 41. 2017 an image published in one of Ecuador most read magazines, *Revista Vistazo*, after the scandal. The image shows Rafael Correa, Héctor Rodríguez and René Ramírez driving an electric car to a precipice. The picture also shows a large avenue in construction or abandoned, this reference is connected to a constant critique to Correa's government: the cost of newly constructed highways and the unfinished projects his government initiated but did not complete. (*Vistazo Magazine*, 2017).

During our interview, ex-president Correa conceded that the actors from Yachay had lied to him about the investment, he mentioned that they exaggerated and accelerated a process that had potential in the future but that was asphyxiated in the public controversy that followed. He referred to how the pressure that was piling on the project, unfairly from his point of view, ended up preventing real possible investments from materializing. This allowed me to observe not only the intragovernmental negotiations and flows of information, but also how the president's vision of the project itself was partial, imperfect, incomplete and contingent. His vision always depended on information given to him already shaped by expectations both in terms of the future capabilities included in those reports, but also with respect to the expectations of what actors thought the president demanded of them at particular moments in function of the futures embodied in those expectations.

This grand gesture exemplified in the promoted RedTech investment was their own way of acting upon the contexts in action mobilized in Yachay, not the least by Correa himself, one of them being the upcoming elections and all they meant for the whole government as their ten years in power faced a very closely fought vote that could

turn either way. Additionally, Correa was soon going to be leaving office and Yachay's actors needed to think and act not only with reference to Correa's government and to the expectations they had positioned in Yachay, but also with respect to the potential new government and how the current relational infrastructures, understood as the circuits of relations connecting strategically specific actors, would be modified once the president arrived be it Lenin Moreno or a different candidate. These futures were uncertain but nonetheless demanded positioning, preparation, anticipation; the future as a continuous context for the present shows exactly how a same reference can keep changing both as time passes by and as we observe it from different perspectives. This was also an early sign of how the future Correa had predicted for Yachay was derailing both from his personal control as well as with respect to the uncertainty surrounding the elections. This uncertainty alone invited actors such as René Ramírez and Hector Rodríguez to imagine themselves in a setting without Correa, meaning without a very powerful actor in their relational infrastructures, and having to prepare their own positions with respect to emerging narratives and conditions. In this sense, they were willing to risk the project itself in order to position themselves against the backdrop of the elections and whatever came next.

Even before the elections, in my time in Yachay there was a feeling of hope that Moreno would win, many if not most of the public servers openly supported him and in their free time promoted his candidacy politically. But, there was also doubt and uncertainty regarding how he would govern and what plans, if any, he had for Yachay. One day after the Tesla event I was interviewing one of the directors of Yachay EP's sub-managements, after 10 minutes into the interview my recorder broke and we had to stop the interview but we continued talking. I asked him, informally, what he thought of the Tesla event and the scandal that was unravelling around it, he said that most public servers, including most if not all of the area directors were left in the bling about the event, they were not involved in its planning nor they knew the dimension of the promises that took place. He said, that it was organized between a small circle of the higher authorities both of Yachay EP and SENESCYT, and that he thought it was

a desperate intent to position themselves towards the upcoming elections and the subsequent change in government. My informant also mentioned that he expected Correa to react quite strongly, in his words he said “ya se va a escuchar el rugido del Monstruo desde Carondelet⁹⁶, van a rodar cabezas”⁹⁷, in other words this was something that would not be permitted –normally- within Correa’s government as the Tesla event clearly jeopardized the image of the project as a whole rather than just the reputation and political projection of those involved. But, this was not a “normal” time, it was elections time, and uncertainty was once again taking hold of the country.

In this incident we can already see a dominant context weakening as the Correa administration reached its end point, whether actors agreed or not with the winner of the upcoming elections, what was clear was that they would have to adapt to the new panorama, a panorama that in the case of Moreno winning was expected to be similar to that of Correa with some slight changes. For example, when talking to another informant who was a member of Alianza País and also occupied a high charge in Yachay EP he told me that within Alianza País the under-table chat was that if Moreno won he would start conducting a “purging of Alianza País’s rotten members”. While Correa’s administration was characterized for being quite confrontational in respect to other political parties and the opposition in all of its forms⁹⁸, internally to Alianza País Correa’s position tended to be much less confrontational and tended to protect the internal unity above all, even if that meant portraying an image of unity to the external world that did not accurately portrayed the internal dynamics of the party. This was clear with how the party torn apart in two after the elections⁹⁹¹⁰⁰.

⁹⁶ Carondelet is the name of the palace of the government in Quito where most presidents live and work.

⁹⁷ “we will hear the roar of the Monster from Carondelet, heads will roll”.

⁹⁸ <https://www.youtube.com/watch?v=R9uA8prmQok> (last accessed 10-12-2019)

⁹⁹ <https://gk.city/2017/09/03/pugna-en-alianza-pais/> (last accessed 12-02-2020)
<https://www.lavanguardia.com/politica/20170826/43812085956/dimiten-colaboradores-del-gobierno-de-ecuador-en-medio-de-pugna-oficialista.html> (last accessed 10-12-2019)

¹⁰⁰ <https://nuso.org/articulo/leninismo-versus-correismo-la-tercera-vuelta-en-ecuador/#footnote-1> (last accessed 12-02-2020)

Interestingly, on the next day (the 15th of February), a meeting of Latin American artists –summoned by the “Red de Intelectuales en Defensa de la Humanidad”- was held in Quito in support of Lenin Moreno’s candidacy, with him present. During the meeting, the speeches made a lot of emphasis on the victories of right-wing candidates throughout Latin America in countries that had been part of what people called the “pink tide” or the “21st century socialism” in the region. Special emphasis was put in Argentina and in how in just a few months, a left-wing government that had needed 12 years to rise to power, had been dismantled. In addition, it was discussed how the elections in Ecuador were a juncture for the general collapse of leftist processes in the region, emphasizing how Ecuador could be a key focal point to define the course of that trajectory in the whole region. From their perspective, Moreno’s victory could mean a continuation of the process rather than a U-turn towards a right-wing government like in other countries of the region¹⁰¹¹⁰², what authors have called the “conservative restauration” or “the regional right”¹⁰³. In short, the event I have analysed was unravelling in parallel with other phenomena with deeper or longer durations that were not the background but the substance itself of its dynamics, what actors perceived was at stake, the contexts they mobilized and considered significant; hence, the regional, the national, the local, the institutional and the personal were loosely coupled, being shaped in tandem.

With this analysis, I hope to show that context cannot be understood as a stable entity or merely a background factor, and that it always begs the question: a stable entity for whom? Context can be more fruitfully understood as a rich meaningful landscape that changes not only over time but also with the perspective from which it is observed, a “multifaceted and flexible reference” (Esposito, 2017a), which

¹⁰¹ <https://videos.telesurtv.net/video/645834/ecuador-intelectuales-respaldan-candidatura-de-lenin-moreno/> (last accessed 10-12-2019)

¹⁰² <http://prensa-latina.cu/index.php/component/content/?o=rn&id=64482&SEO=red-de-intelectuales-respalda-candidatura-de-lenin-moreno-en-ecuador> (last accessed 10-12-2019)

¹⁰³ https://www.youtube.com/watch?list=PLCo_HYAuidB-6FwoOEcc0--LzIKIt2VJs&v=BddiOD0gRic (last accessed 10-12-2019)

researchers can observe at multiple timescales by zooming in or out strategically (Hyysalo et al., 2018). A generative reference that triggers constant attempts to anticipate it and to reposition in the present accordingly. In short, more a problem to be solved than a stable structure. Hence, it is a reference that, when expected to become a collective reference for action and coordination in the near or distant future, is in constant dispute; shaped by political sensibilities, expectations in clash, emergent opportunities and by the trajectories it shapes at different rhythms.

The next section will describe what happened after the elections with an unexpected turn of events in the new government, and how a new set of actors, contexts in action and expectations entered the project generating a variety of effects. Among them the reescalation of Yachay along with the breakdown of the initial expectations.

6.3. After the elections: Crisis, rescaling and reconfiguration

The processes that would end up changing Ecuador's contexts at stake started with conflicting visions that can be identified even before Lenin Moreno became president. It has to be noted that it is amply recognized that Moreno did not want to be Alianza País's candidate for the 2017 election, he refused several times before being convinced by Correa himself, because according to their polls he would be the only figure of Alianza País that could win the upcoming elections. Moreno was not perceived as a threat, maybe as a gamble, but as one that Alianza País perceived as having to take in order to remain in power and extend their present. This situation is also a testament of the degree of centralization that Correa had across the 10-year span, his figure was so central to the process that there was no one else to succeed him, at least that is what Alianza País themselves conveyed, and had to put Moreno as candidate not because of his adequacy as leader but because of his calculated popularity in the polls. In fact, it was perceived within Alianza País that Correa

personally positioned the candidacy of Moreno¹⁰⁴, and others considered that Correa was the one that should run for a third term in office instead. This election was considered of tremendous importance both nationally and internationally as the “progressive governments” of the region had lost several elections already, Atilio Boron one of South America’s most popular left-wing political analyst called the elections in Ecuador “the battle of Stalingrad” for the political tendencies of the region as a whole¹⁰⁵.

Lenin Moreno was appointed as Ecuador’s new president the 24th of May 2017. As mentioned before, he was elected as a member of Alianza País, the previous government political party, and was expected to continue Rafael Correa’s line ideologically, economically and politically. This was based on the assumption that he had been his vice-president for six years (2007-2013) and had worked for the government for the whole duration of Correa’s 10-year mandate. The elections were very close, he won in the second round with a 51.12% of the votes against the 48.88% of Guillermo Lasso from the opposition, and there were several unproven accusations of electoral fraud. Early in Moreno’s government, it became clear that the prospects of how Moreno would govern that got him elected were not going to be fulfilled and that a smooth transition or continuation with the previous government’s chief strategic economic and public policies was not going to happen.

Moreno started criticizing Correa publicly for the first time very early in his government, especially accusing him of overspending public resources and indebting the state in very perilous ways¹⁰⁶. At the beginning, these were restrained comments

¹⁰⁴ <https://www.planv.com.ec/historias/politica/la-chismografia-alianza-pais-al-descubierto> (last accessed 12-02-2020)

¹⁰⁵ <https://www.telesurtv.net/bloggers/La-batalla-de-Stalingrado-se-librara-en-Ecuador-20170205-0003.html> (last accessed 12-02-2020)

¹⁰⁶ One of the central nodes of conflict were Moreno’s accusations of corruption during Correa’s government. One emblematic case was Odebrecht, a scandal that spanned across South American governments, and for which the ex-vice president Jorge Glas was jailed. Interestingly, during the last months of the Correa administration the scandal of the corruption networks involving Odebrecht and government officials was already unravelling. In fact, Correa sent public officials to Brazil to gather information about the case. Moreno seems to deny this an associate the investigation around the corruption charges to his government only. This may be the case because Moreno seeks to cut his ties with the previous dynamics of the government of which he was part. <https://www.eltelegrafo.com.ec/noticias/politica/3/alexis-mera-encabezara-delegacion-que-viajara->

that eventually escalated into an open conflict and mutual accusations¹⁰⁷. The initial belief of Moreno being his own person but also governing in the line of the previous government, a line that he had promoted during the elections, fell apart when Moreno suggested the need for a “national dialogue” including all the opposition actors with which Correa’s government had an astringent relationship. The by-then ex-president Correa called this a “mediocre” and “disloyal” strategy.

Yachay and other "mega-projects" (in Correa’s words) or "pharaonic projects" (in Moreno’s words) were singled out and publicly criticized by the government itself; this had not happened in the case of Yachay in the whole duration of the previous government. Their overall cost and the “pretentious” visions behind them were the main themes going around the debate. Moreno argued that these kinds of projects showed that the previous government did not have their feet on the ground, lacked context sensibility of what was possible for Ecuador taking into account the economic crisis and that, consequently, they had endangered the whole country’s short and mid-term future in the way.

Very quickly, these confrontations generated an internal conflict in Alianza País, those in favour of Moreno and those that remained “loyal” to Correa. Some members of the party itself argued that this breakdown had already existed during the previous government, sometimes expressed in division and conflicts between ministries, and was never internally resolved in the movement. These internal conflicts have left a track in Yachay's history itself, as previous chapters of this thesis have shown, through the authorities on whose hands Correa commended its development and their own

[a-brasil-a-recabar-informacion-por-caso-odebrecht? cf chl jschl tk =92c92141b8a8c72ea01d62ba7e03095be4654fa3-1575898635-0-AebH -ZJleSk1N9HLI6gaS4eVokuwv23s5 -rOLfZ OXbDmQcncrD1x-ExnyHqMVrnrx5jZYba9NIVVg8WUMdTd94ehyCi6iG 8gkKTSyRD2oFBn9GVbVY8Wbh7zoRNCsnMnipe wMn-pB4sNeNo79-vOjvcvJHODplEwTkKFisCAE4cliw za-xSAD6Y4bPpYujtQQdN8Bz5uVhIAbtgJnlyjBppiUp4Ok-jlf8wYBRRZRteksWL3IKrCDxWazrQxpSN--XLHrJLLFJ9oocZuW7H6TOjz92D7G0NxH77cSJe21H8dQgmjMR2BpVu4M1yV2HOkFbxzlk-Pa4XmicEvFQPQrTPVwD3dqqYuuPk2pvJ5TBqWf8D8TL73wNeA0WIYJQ-oTWtjEo2ySINbe6miQVchPCWzx0egU0QhEnwJRpk0A0b34E6orYWCnu-pEC-dfaL jm7USrLeS92k2dEaJoex8YyBUJ1LQggBtoWk144u](https://www.eluniverso.com/noticias/2017/07/11/nota/6275359/lenin-moreno-reconoce-que-situacion-economica-dificil-falta-mesura) (last accessed 10-12-2019)
¹⁰⁷ <https://www.eluniverso.com/noticias/2017/07/11/nota/6275359/lenin-moreno-reconoce-que-situacion-economica-dificil-falta-mesura> (last accessed 10-12-2019)

circles of trust, influence, and agency. But, this specific and dynamic configuration of the relational infrastructures in Yachay were not just a sub-product of the constant negotiations going on within Alianza País and the government itself. On the contrary, they were a situation, an arena, which played a significant role shaping the whole relational infrastructures of Alianza País and the government. This can be observed, as analysed in previous chapters, in the importance that Yachay had for Correa, the negotiations and tensions with respect to who would take charge of the project, the pressure and expectations surrounding the progress of the project within the government as well as in the media, the way that actors positioned themselves anticipating the horizon of the national elections, etc.

Within the Moreno administration this tension was mobilized, escalated into becoming a context. Actors were expected to reposition under this new configuration, whatever their interpretation of it, and they did so. Even before the elections there was a rumour going on within the government about Moreno's plan to perform a "cleansing" of Alianza País if he won, one of my informants put it this way during a conversation we had after the RedTech scandal:

"Lenin is planning to clean the pus from Alianza País." (Yachay EP
Area Director 2, personal communication, 2017.)

There was already an expected change in the way of governing, in the relations within the government even when the same party was potentially going to rule, but no one expected how quickly the tension would escalate. One of the key temporal aspects of the early Moreno administration was precisely that he broke with the expectations of governing in the same line as Correa. Instead, he generated a snapping point with the process and, thus, reconfigured Correa's government from being part of an ongoing present into being a past, a harmful backdrop. In that sense, the previous government was no longer a preceding moment in the same political process but the background against which his government would position as the novel. Correa's government became merely a context in the traditional sense of the term; the whole ten years were reinterpreted, observed from a different perspective, mobilized and

stabilized through another lens, this is, contexted but this time as something toxic. Hence, requiring an antidote in the form of a particular set of actions in the present. Contexts are not perceived neutrally and later acted upon: they already emerge charged with affordances and are perceived in accordance with our own capacities to act in and through them. At each present the relation and evaluation between pasts and futures is readjusted and an actualization of both futures and pasts is produced.

The main temporal political strategy of the Correa government was to sustain the perception of an extended present in which the country had finally ended the partidocracy and left behind the “long neoliberal night.” Ecuador was now looking forward through public investments in infrastructural projects such as Yachay to the long-term possibility of overcoming the historical dependency on oil and other raw commodities. All of this being sustained precisely by an international boom of commodities, internal legal restructuring and the expansion of the administrative apparatus of the state. Moreno’s main temporal strategy seems to be the reinterpretation of precisely the aforementioned “advances” under the light of corruption, suspicion and decay; which in return generates the collapse of the promised futures, once perceived as ground-breaking now the future seems menacing, less fertile for possibilities, and more certainly charged with crisis. Of course, this is oriented not towards merely making observations about these elements from the past and the future, but rather to making the present actionable in function of those expectations, which have been stabilized into the form of contexts: relatively stable reference points for action and sense-making which show both elements of futures, ongoing presents and pasts.

Contexts here are connected to the partial stabilization and materialization of expectations through public statements, decisions, public measures, reiterative discourses, etc. Thus, contexts are not understood as pre-supposed external entities, but rather as an ongoing practice I refer to as contexting, understood as the practice of turning specific observations coming from particular positionalities within sociotechnical assemblages into collective dynamic references for action and sense-

making. This is a process in constant dispute as seen in the change in contexts from the Correa administration to that of president Moreno. The German sociologist Niklas Luhmann has referred to modern society as polycontextural¹⁰⁸ (Knudsen, 2017; Lee, 2000; Luhmann, 1997), and while I by no means aim to propose a general theory for society as Luhmann does, I think his approach to polycontextuality can be applied to the multiplicity of actor's positionalities within sociotechnical assemblages, their partial situated observation points, and to the connected constant social struggle to describe, position and define contexts momentarily.

If one accepts the situated and partial character of actor's observations and understandings within sociotechnical arenas in the present, as the BOAP approach ensures (Campagnolo et al., 2019b; Hyysalo et al., 2018; Pollock & Williams, 2010a), then one can also accept that actor's experiences and understandings of the past are also partial and situated, as every present becomes a reference in the past eventually. And, thus, actor's understanding of the past is also partial, incomplete, constructed on the base of limited evidence, on the base of limited and partial observations, and can never match the complexity involved in the notion of a common past¹⁰⁹. Then, the past then keeps a generative relation with the present, which moves in both directions, precisely because every present exceeds every specific actor's capacity to grasp it, and grasp the simultaneity of all the durations at stake. In other words, dealing with the pasts is as problematic and complicated as dealing with the future.

¹⁰⁸ "The world society has reached a higher level of complexity with higher structural contingencies, more unexpected and unpredictable changes (some people call this 'chaos') and, above all, more interlinked dependencies and interdependencies. This means that causal constructions, (calculations, plannings) are no longer possible from a central and therefore 'objective' point of view. They differ, depending upon observing systems, that attribute effects to causes and causes to effects, and this destroys the ontological and the logical assumptions of central guidance. We have to live with a polycentric, polycontextural society. Given these conditions, there is no longer a quasi cosmological guarantee that structural developments within function systems remain compatible with each other. Science does not add knowledge to power but uncertainty and risk to decisions" (Luhmann, 1997. p 75)

¹⁰⁹ Interestingly, scholars working on the Predictive processing approach to cognition have also highlighted how sub-personal and personal perception arise from the constant necessity of the embodied mind to generate, on the base of always limited information-experiences about a world, a model of the world consistent of predictions about the states, relations and beings of that world, that change across time but are also partially stable. (Clark, 2013a; Constant et al., 2019; van Dijk & Rietveld, 2018)

Defining contexts in spatial and temporal terms is a way of dealing with, and making actionable, the density that characterizes social complexity in terms of an actor's trajectory and scope.

Definition is a key characteristic of contexts, precisely because one of the key aspects of contexts exists in the definition of what counts as text in a situation and what counts as context, context here understood as its surrounding elements or external referents that work as explanatory forces rather than being constituted by the text itself. Defining what is external, and thus out of our control, is one of the aspects of contexting. An important element of this definition is temporal framing (Huebener, 2015a) as many times what is external is defined as being past, in this view the past is external to the present, it shapes it but is not shaped by the present. This is, I argue, a detemporalization of the past, because it is portrayed as something that happened once and for all, observable from a "god's trick" (Haraway, 1988) absolute observation point, and is not open for reinterpretation or re-exploration across time. Similarly, this can be read as past-ification of contexts, as these are represented as dynamics that have already happened, and thus are external to the present, cause it in some manner or other, but are not shaped by it. This idea matches with STS's critique of the traditional assumption of sociotechnical order, and entities such as "Society", "Science", etc., as something that is achieved once and for all, rather than being constantly enacted across multiple sites in specific ways through situated practices. I try to highlight how contexts are situated too, connected to expectations and can be more productively understood as processual practices of composing dynamic referents for individual and collective action, rather than presupposed.

In the context of crisis for example, the observer seems to portray that everything is about to go out of control, that the latency between pasts events and current, or forthcoming, consequences is shrinking and is about to collapse. Crisis, then, can be understood as temporal collapse because both pasts (through the reduction of latency) and futures (through the crystallization of its multiplicity into the form of an unavoidable consequence) are compressed into the present. Lenin Moreno's points, for example, to the over indebtedness he inherited from Correa's government as the

external force, coming from the past, which is not in his government's control, and to his austerity policies as a necessary measures in order to avoid the crises which is already taken over the country or is waiting just a step ahead in the future if radical measures are not taken. It is difficult to portray two contexts as different as those Correa mobilizes and Moreno portrays.

On the one hand, from Correa's perspective his government left Moreno a country full of new infrastructure, free from "the old country" represented by the partyocracy, with long-term investment that other governments would harvest in the future, and with ample social support. In a few words, Correa's expression, he left "la mesa servida"¹¹⁰ for Moreno's government. On the other, Moreno defines now Correa's government as the "lost decade", and more recently when asked about who will govern Ecuador after his period ends: "The people will decide that, but I guarantee you that they will find a country in much better conditions than those that we inherited." I think this overlaps in a very interesting manner with how ex-president Correa's descried what he found when he came into office in 2007, I already referred to this fragment back in chapter 3:

It was a disaster, a total disorder, a lack of economic policy, a lack of an economic vision. Remember that the economy is a social science, it studies human society and the goal is human welfare, all the rest are means. Suddenly, they sacrifice the means for the objectives, then the country risk indicators and we worry what the IMF will say. But we were one of the most unequal countries in the region, we had generalized poverty. I found a country without institutionality, all dispersed, with aberrations. For example, we were dying of thirst by the source. So, keeping savings for the times of lean cows, that is what was never understood. (Correa, 2018)

¹¹⁰ "The table served".

I believe this overlapping portrays how central are the mobilization of this type of temporal understandings in Ecuadorian politics, and how important it is in the political strategy to frame encountered conditions basically as demanding certain actions, constantly tied to ways of understanding and mobilizing pasts-futures through expectations. This mode of temporal politics is tied to the mobilization of negative expectations that portray futures that need to be avoided or that will become actual if radical measures are not taken in the present (Tutton, 2011). Again, through this temporal structure we could say that the present does not necessarily come before the future, rather than a meaningful present-one charged with salient potentialities for action and sense-making- may be an emergent phenomena from the process of the constant actualization of our expectations and predictions about others and about the world. Current research around the role of prediction in cognition highlights precisely the centrality of anticipation in our processes of perception, action and social interaction (Barrett & Bar, 2009; Clark, 2012; Constant et al., 2019; Miller & Clark, 2018). In politics, the anticipation of future estates, especially by actors who as Moreno and Correa occupy one of the central spheres of the political apparatus –even more in a state like Ecuador that has tended historically and contemporarily to a centralization of influence and power on the executive branch of the state(Meléndez & Moncagatta, 2017; Simon Pachano, 2010; Polga-Hecimovich, 2013)- has enormous importance as it positions the government’s scope, lines of action for entire public programs and can become resources for taking radical measures that would not be salient otherwise, and that more often than not are contexted into stabilized referents for actor’s both in the state and the civil spheres. The requirement for civil servants to attune and accommodate to these perspectives across government is a testimony of this.

I want to point out that contexts here, and their connection to expectations, are so important because these actors have enormous power and their personal interpretations of the past and the associated futures tend to be converted by the stately apparatus into public policies, official discourses, legal dispositions, the

mobilization of allies accordingly, and as seen in the 2019 October popular protests the display and justification of the use of violence by the military and the police.

This tension erupted utterly when Vice President-elect of the new government, Jorge Glas, who had also been Vice President of Correa, was brought to trial and imprisoned on charges of having participated and obtained direct benefits from several cases of corruption during the past ten years. Since then a halo of corruption has surrounded the public discourse of the new government in reference to the Correa government. A good number of works, contracts, and authorities of the previous administration have been or are being investigated and prosecuted at present. Correa himself has been accused of having a criminal responsibility in the way his government managed the Ecuadorian public debt. Yachay has not been an exception in any way to this tendency.

Yachay was known as the emblematic project of the Revolución Ciudadana, the jewel in the crown of former President Correa, the project that guaranteed their legacy would resound for decades in Ecuador's history. This is one of the reasons why Yachay was at the centre of the conflict between Alianza País's factions during the change of government and in the spotlight of many of Moreno's main criticisms of his predecessor and former ally. In some way, Moreno's objections of the project were well received in the media and soon after the new administration settled, specialized examinations of the comptroller's office were opened to detect everything that had been done wrong to that point.

By the end of 2017 it was clear that Moreno's government was not only going to pursue a very different line of action to the one expected when he was elected but that a significant strategy for his government would be a sustained scrutiny and disentanglement of some of the previous government's key public policy programs, economic strategies and political ties. For many analysts this has consisted of a reversal and unpicking of Correa's policies¹¹¹. Furthermore, this tension has

¹¹¹ <https://jacobinmag.com/2019/03/lenin-moreno-rafael-correa-ecuador> (last accessed 10-12-2019), <https://www.economist.com/the-americas/2019/04/11/lenin-morenos-new-economic-policy> (last accessed 10-12-2019), <https://www.ft.com/content/aa2c331a-e265-11e7-97e2-916d4fbac0da>

surpassed the previous configuration and has now settled as a clashing point between Correa's and Moreno's administration, with the later focusing on Yachay as one of the points of departure and differentiation in respect to his predecessor. For instance, 39 different exams have been ordered at the National Comptroller agency to conduct in Yachay, both the Public enterprise and the University have been heavily criticized by Moreno. Correa has responded to these attacks framing how Moreno's attacks on Yachay show his generalized lack of understanding of Ecuador's dynamics and his "treason" to what he had defended for a decade. This is how Correa referred to Moreno's approach to Yachay and to how quickly the expectations embedded in the project's future had changed:

They are attacking Yachay because they know it is the one project I could not leave behind, if I had to renounce everything else but Yachay I would: it is the future of the country (*la Patria*). They are destroying our legacy for a plate of lentils.¹¹²

The focus of the Moreno government's attention, at least on its presidential guidelines, seems to have focused on the immediate past, that is, on the Correa government, those invisible aspects of that government and on Moreno's constant search, on the one hand, to justify his role in that government and, on the other, to constantly break his connections with it. Moreno's way of rereading the immediate past and seeking to show aspects that were invisible constitutes his own form of temporal governance. In his own way he has sought to justify his present, and he has done so continuously during his more than two years of government, through a constant attack on the previous government, but having been an important actor within that government, so much so that he was vice -president and presidential

(last accessed 10-12-2019), <https://www.worldpoliticsreview.com/trend-lines/27787/how-ecuador-s-moreno-is-undoing-correa-s-legacy-and-not-just-with-assange> (last accessed 10-12-2019), <http://www.coha.org/from-rafael-correa-to-lenin-moreno-ecuadors-swing-to-the-right/> (last accessed 10-12-2019), https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0718-090X2018000200281 (last accessed 10-12-2019), <https://www.counterpunch.org/2018/05/15/ecuador-under-lenin-moreno-an-interview-with-andres-arauz/> (last accessed 10-12-2019)

¹¹² Rafael Correa, personal communication, 2018.

candidate representing the tendency of that government, the rupture does not happen once and for all but is repetitive and in each present situation the past is mobilized again¹¹³.

This shows us again the generativity of the past, it is not the case that we can travel to the past and change it effectively, but that the complexity of each present (including all those that already exhausted becoming then the pasts) exceeds the ability of the actors to capture everything that happens. The past is open not because it is not irreversible but because of its own complexity, because in reality they are pasts, in dispute and always partially observed, open for constant reinterpretation not necessarily linked to a search for truth but perhaps to make sense of, and make, the present actionable. It is in this sense that I believe that expectations understood as interfaces between futures and pasts have an important analytical role to play in Moreno's governance, just as they had in Correa's governance issue that I tried to highlight in chapters 3 and 4 of this thesis. Moreno reinterpreting the immediate past also modifies the futures at stake associated with those pasts, embodied and imbued in the expectations mobilized during the Correa government, for example in Yachay. In this case, his way of interpreting the immediate past is to generate constant suspicion about it, about all the achievements that were celebrated and the supposed advances that the country had.

¹¹³ For example, in a recent interview with the Spanish newspaper "El País" on the 4th of December 2019 president Moreno blames Correa's and his allies for the volatility associated to the massive popular mobilizations that took place across Ecuador during October 2019 after his government announced a series of austerity-oriented economic measures including the cancellation of the subsidies on fuels that Ecuador has since the 70s. In this interview said the following about the mentioned topic: "Traditionally, the indigenous people have protested against measures that they don't think will benefit them, and generally, they have done so peacefully, and they did so last time. What happened is that they were infiltrated by criminal groups, paid by supporters of [former Ecuadorian president] Rafael Correa, as well as people from the FARC [Revolutionary Armed Forces of Colombia] and the ELN [National Liberation Army from Colombia], and people on the payroll of [Venezuelan president Nicolás Maduro...]" and also when asked if his former alliance with Correa has now become a matter of enmity: "Yes. I am still purging him out. Do you want me to say *mea culpa*? I took no interest in working out whether what the former president said with a lot of conviction was true. No corrupt person has this fact written on their forehead." (https://elpais.com/elpais/2019/12/04/inenglish/1575463799_435430.html (last accessed 12-02-2020))

Furthermore, Moreno since his arrival to the presidency has mobilized a particular context, that of the *crisis*¹¹⁴. Highlighting no longer a bright, fast incoming future towards which Ecuadorians can look upon but rather a grim horizon, which should be seen as Correa's "true" legacy. Packed with corruption, over-debt and confrontation. Of course, crisis as a mobilized context materializes into legal, policy and material changes, into modes of governing (Adey, Anderson, & Graham, 2015; Esposito, 2011)¹¹⁵. In a time of crisis, one has to decide what to continue and what "needs" to be left behind, be it abandoned unmaintained or simply destroyed. Through the context of crisis Yachay is deemed as a failure (a project that is 5 years old of a 40 years span just to finalize its construction), and the context of failure materializes in practices and in the occlusion of practices, in the case of Yachay it leaves apart ideas of repair and maintenance and highlights decay:

"The material worlds around us embed rich and varied temporalities of their own, many of which run counter to general and undifferentiated stories of speed. The actual rhythms that shape and define human experience in the world are multiple and diverse, and while under the right circumstances they may "sum" to speed, they are never wholly constituted or defined as such. An important subset of these rhythms is grounded in the ongoing work of maintenance and repair by which the durability of such systems, together with their distinct processes of change and unfolding into the future, are produced, sustained, and transformed." (Jackson, 2016, p. 185)

Nonetheless, an unavoidable crisis is not the only construction possible of the current moment as already other readings of the situation, other contexts, have been provided including proposals on how to surpass the transition without applying generalized austerity measures that would endanger labour and basic rights

¹¹⁴ <https://blogs.lse.ac.uk/latamcaribbean/2019/09/12/the-crisis-narrative-of-ecuadors-lenin-moreno-has-obsured-the-real-winners-and-losers-of-recent-economic-policy/> (last accessed 10-12-2019)

¹¹⁵ I am exploring this broader contexting of the notion of a crisis in the specific case of Yachay.

advancements achieved during Correa's government, especially for the middle and lower classes (Dávalos, 2018; Foro de Economía Alternativa y heterodoxa, 2017)¹¹⁶.

If one takes into account the importance and power of the state in the Ecuadorian economy, these predictions about crisis tend to be performative (Esposito, 2013; MacKenzie, 2007), they are not a camera of an already installed future but rather a motor that, in part, generates that future. In Ecuador, this has translated into austerity measures including firing public servants, reducing public spending in key sectors such as education, including infrastructure. A specific, or localized-embodied-embedded construction of a context, opens a set of actions that make sense in that set of expectations. It is in a way a future that generates a present.

I could not find any work on STS explicitly on the notion of crisis, as many other disciplines the use of the word is extensive and productive when utilized to characterize specific collective situations, but a problematization of the term is lacking. This is not the case in other disciplines where crisis has been problematized more, or at least similar approaches to defining social temporalities have been studied. For example, anthropologists have analysed emergencies and the different narrative and material elements involved in governing through exceptionality (Adey et al., 2015), as well as thinking through the different implications of using crisis as our main descriptor of social reality and how it relates to our common understating of time (Vigh, 2008). Trying to contribute to this literature and bridge STS with this kind of research in this chapter, I try to highlight the practical components of deploying crisis narratives and how this shapes relations in sociotechnical projects such as Yachay. I connect the notion of crisis to those of contexts and expectations I have been working on across the thesis, in order to understand crisis as a context in action that partially stabilizes particular ways of understanding pasts and futures.

The concept of crisis has to do with judgment and decision, and these are related to making differences, to marking limits, to breaking, to generating a change, to

¹¹⁶ <http://www.planv.com.ec/historias/sociedad/10-criticas-economistas-izquierda-al-programa-economico> (last accessed 10-12-2019) and <http://foroeconomiaecuador.com/fee/historia-de-la-no-crisis-en-tres-graficos/> (last accessed 10-12-2019)

differentiating pasts from futures by putting a halt to some aspect, or aspects, of the present. A moment of crisis is precisely a temporary window in which decisions break past trajectories, or try to do so, to keep the future open. Crisis are moments that are lived by eliciting decisions, that force hands, and by doing so also justify making cuts. During them actors, institutions, collectives seem to be forced to incorporate, at least partially, a problematic external element or a set of elements, be it from any environment, so to speak, abandoning a set of expectations/narratives and therefore triggering transformations internally. This has been the case in Ecuador both during the 2015-2016 crisis triggered by the international economic fluctuations of the dollar, the fall in the price of oil and the 2016 earthquake; and during the current scenario in which the new government argues that the country faces an upcoming crisis that puts at risk the future of the nation and demands a time for austerity, modesty and sacrificing inefficient projects, institutions and public employees.

Regarding the institutions or organizations, crisis tends to demolish certain futures and reify the past momentarily, obliging these organizations to make decisions in the form of prioritization. In a sense, inviting them to define what can be saved and what cannot, or in other words, what cannot continue or be a priority at a given time if the institution –or in this case the nation- must survive. There seems to be a gap in the literature in respect to how temporal configurations, such as crisis and the associated austerity measures, are deployed as a way of influencing urban development and the management of sociotechnical projects:

...the impacts of austerity cuts to planning budgets have temporal aspects that remain relatively under-developed in the burgeoning literature on 'austerity urbanism'. Our case has shown that if the 'benefits' of slow city planning, that authors such as Weber are arguing for, are to be achieved, then they require planning authorities to possess the capacities to control and oversee the rolling-out of development processes. Austerity cuts are undermining

such capacities, allowing for 'temporal fracturing' that opens up opportunities for powerful interests to take a stronger role... Future research needs to explore who governs planning times and how is time deployed selectively to influence the politics of urban development. (Raco, Durrant, & Livingstone, 2018, p. 1191)

One of the elements that we can use from the Luhmannian theory of the crisis is its self-describing element: for Luhmann, the crisis is a form of self-description of modernity or functionally differentiated social systems. Here the question for the enunciator, for the observer announcing the crisis, becomes key. What does it mean, for example, that the president of Ecuador defines the country in those terms, what does that self-description mean? What effects does it have? What makes it possible to observe and what does it make it actionable? What it does not allow observing and leaves unchecked? Then, it becomes interesting to think about the political effects of self-describing a system or country as losing autonomy, as losing the ability to decide, as losing power to external factors (spatially or temporally). Is it not then the crisis a way to at the same time give agency to other actors and forces, and, at the same time centralizing agency by portraying the actions taken from the crisis as a context as necessary and inevitable? The crisis overdetermines the system, overdetermines the observer, but what does it mean to self-describe in these terms, what does it mean to anticipate structural transformations in oneself?

In a way, the notion of crisis has its power precisely by collapsing the context into the text, by erasing that difference that somehow in ordinary life, or in the "normal" functioning of things, distinguishes what we identify as the phenomenon at stake and that which operates as its companion, its context. In the case of political decisions as in the case of Yachay, crisis appears at the same time as the dissolution of the border, of the difference, between text and context, and as the absolutization of a context to the point that the future lived as multiple potentialities collapses into the certainty of crisis. The paradox of this situation, and by no means less generative, is that this collapse of the future over the present in some way gives vibrancy to the present:

everything is to be done here and now, and decisions that we would not otherwise take in that now appear as viable.

Hence, two important characteristics to analyse the concept of crisis, which can be paradoxical, are its self-referentiality and its temporal ambivalence. The first has to do with the fact that it is a form of self-description of the society, or that a section of the society self-describes the entire society in those terms. Because the crisis we are talking about is not referred to the personal level, or to what the actors consider the personal element, but to a collective level: national or entire institutions, the state, the entire economy. The second, its temporal ambivalence, has to do with the temporal structure of the crisis: the crisis at the same time indicates that the present is at risk, and therefore the future too, and that what caused the present to be at risk already happened, it is in the past. The crisis aims at the same time to define the current moment as critical or in crisis, as to assimilate or imply that the true critical moment has passed and that we now live the consequences.

In the case of Yachay, the crisis narrative both fed on Yachay as an example or materialization of many of the characteristics associated to Correa's government and that could justify these measures. Soon after Moreno took office Yachay EP's administrative heads, including Hector Rodríguez and almost his entire circle of trust, were replaced and new authorities were positioned quickly. Jorge Martínez was appointed as new general manager of the public enterprise¹¹⁷, a move that was interpreted by the national press as Yachay rolling along with the changes being implemented across the state. Martínez had been mayor of Ibarra, the closest city to Yachay, governor of the province of Imbabura, and had vast experience as a public servant. He was expected to "localize" the project in Imbabura (the province of Ecuador in which Yachay is being built) as this was identified as one of the project's significant shortcomings until that moment. According to this view, the previous administration had focused more on the international and national impact of the project than on building strong roots locally at departmental level and with its closest

¹¹⁷ <https://www.expreso.ec/actualidad/yachay-se-apunta-al-cambio-EX1527170> (last accessed 10-12-2019)

urban neighbours. The next sections will describe how these processes were experienced in both Yachay EP and YachayTech.

6.4. Uncertainty at the state level, adjustment times

A strong change in the rest of the administrative body followed the entrance of the new administration to Yachay EP: the offices of the public enterprise were permanently closed in Quito and moved entirely to Urcuquí. In the process, many civil servants that lived in Quito and used to travel back and forth resigned, as they did not want to move permanently to Urcuquí or Ibarra (housing arrangements in Yachay are not available to this day). Another significant number were directly fired from Yachay considering that they were too close to the previous administration or their work was not justified as necessary in respect to the politics of austerity implemented nation-wide as a result of the contexted crisis.

The public enterprise's funding was severely limited. This whole process generated a change in the administrative staff of around 3/4s concerning the previous administration. Most of the new civil servants live in Ibarra and are native to the province of Imbabura. This has generated issues of lagging as many processes were disrupted in their tracks, institutional memory has been lost, and the new wave of public servants needed an adjustment time to adapt to the project and adjust their respective skills and experience to what was required from them. We can see these points illustrated with the example of one of Yachay EP's employees that was part of the previous administration and has had to adapt in multiple ways to the management, the relations coming into play and the dispositions commanded to the public servants. A fragment of my field journal after having a conversation with him reads as follows:

Today I travelled on the bus to Urcuquí with with one public employee of the EP; we talked about his perspective of the project, of what is happening internally and the changes that have taken place. He has a positive vision of the new administration, he thinks they do things better for now but at the same time that it is time for them to show

their true colours and state what plans they have for the project. It's been 6 months he said, and it's been a very political issue. He also said that one problem is that there is no direct conversation with the general manager, that they must go through the technical manager and this limits and complicates the communication... He told me that he currently lives in Ibarra during the week and the weekends in Quito. It has been a problem because before moving to Ibarra he lived all week in Quito, but without the transport provided by Yachay EP that was discontinued due to austerity, he had to wake up at 4 AM to catch the bus at 5 and be arriving 8:30 to Urcuquí. The intense fatigue at 11am was the price to be paid, in addition to a working day of more than 12 hours. (Field journal, December 2017).

When Moreno first visited Yachay Jorge Martinez, the new general manager, presented a public briefing on the "real situation" of Yachay, and on what they proposed to do to solve the main issues. He highlighted three main problems. First, the absence and poor quality of infrastructure (especially concerning the university, which to this day lacks research laboratories and sufficient classrooms). Second, too many employees in the public enterprise, which generated high operation costs. Finally, false reports from the previous management in respect to the actual private investment Yachay had received (the previous administration claimed it was around 55 million dollars while the present management claims they have been able to confirm only 2.8 million) which meant that the project was suffering from a shortfall of private investment.



Figure 42. Jorge Martínez, Yachay EP's new manager, on the 17th of September 2017 when Lenin Moreno visited Yachay and assisted to the report about the conditions that the new administration found in Yachay. President Moreno is sitting in the middle, above his head we can see a visualization of the proposed "re-dimensioning" of the project.

To solve these issues, they proposed, firstly, rescaling of the whole project, to resolve the infrastructural problems as soon as possible, and secondly a call for special examinations from the National Comptroller Agency (Contraloría General del Estado) to assess the previous management's work in depth. Those special reviews were developed while I was there collecting data and two public reports were presented establishing legal charges against high authorities of the previous administration on the base of illegal practices, which range from stepping over public contracting processes to nepotism and lack of sufficient justification for controversial administrative decisions. These legal processes are currently developing, and substantial economic charges to those authorities were announced, some of them reaching penalties of millions of dollars. In fact, processes of scaling or de-scaling involve both assembling and disassembling, preserving by adjusting and destroying by breaking interrelations (Ehrenstein & Neyland, 2018; A. Tsing, 2000; A. L. Tsing, 2012).

The re-escalation of the project was underway. The new administration prepared three different scenarios of how to do it based on different assumptions of what

Moreno and the high instances of Ecuador's government could decide to invest in Yachay. Neither the political intention nor the economic availability were clear. The new administration worked with one of these potential scenarios; this plan reduces the area of intervention of the project from 4462 hectares to 600 hectares decreasing the amount of investment required, releasing a significant amount of land for leasing, and leaving behind components of the original master plan. This, at least, seems to be the plan selected by the new administration of Yachay EP, but it is not clear at all what will happen with the project as a clear decision from the higher national authorities is lacking.

One of the characteristics of Lenin Moreno's government has been the uncertainty surrounding the plans he would implement regarding public policies, which projects it would discontinue and with which it would continue from the previous period, to which sectors he would give priority, etc. The entire state apparatus has been aware of this, and until several of these lines were explicitly defined recently, firm decisions in many ministries and projects such as Yachay were stopped or moving very slowly, waiting. In Yachay, this has caused a very unclear landscape of how much of a priority would Yachay be for the actual government, how much economic investment it would receive and if it would have political backup at all. To advance with the readjustment of the project Yachay EP's worked with one possible scenario despite the assumptions in which it rested had not being confirmed by president Moreno and his circle of trust. This uncertainty resonates as many of the public servants fear that the government decides to cancel the project at any time and they would lose their jobs in the middle of economic and political turmoil.

High uncertainty surrounded this topic until late 2018 when Moreno, after a year of the mandate, presented his "reactivation economic plan." One of the plan's main policy is to reduce the number of public enterprises in Ecuador to make public expenditure more efficient. Some public enterprises will merge, and some will disappear. Two weeks ago, the government announced as part of this plan the liquidation of Yachay EP by 2021. Nonetheless, the University will remain alive in the plans of the current government. Even so, authorities have not released details about

the process in which the liquidation will take place, nor details or any plan regarding what will happen to the project itself when the public enterprise disappears¹¹⁸. In a way, Yachay EP has fallen under the spectrum of non-priority within the narrative of crisis and the associated practices, while YachayTech remains in the plans of the government but with no clear economic or political backing.

6.5. The University: consolidation across waves of change

YachayTech has grown, it now has 1300 students, and during October 2019 it will graduate its first ever promotion. During the time elapsed since its inauguration in 2014, it has continued its growth and has been able to attract the interest of new students in the degrees it offers. During the last 12 months, the student population has grown in such a way that they have run out of classrooms or enough housing for new students: physical infrastructures are lacking, some of them stagnated due to absence of resources, some others stopped due to litigations. Classrooms have been adapted in buildings that had not been designed for classes, but for bureaucratic procedures, students were given housing that was originally intended for people interested in living in Yachay, such as investors, entrepreneurs or for members of the public service itself. The arrival of new students has put pressure on the infrastructural deficiencies of the university: laboratories, adapted classrooms, materials for laboratories have all been reconfigured from what is available. Being in an age of austerity, the hiring of new lecturers has been very limited, instead, they

¹¹⁸ Beyond what the process means for the workers and authorities of Yachay EP, it is not clear either what will happen with the livelihoods of the communities living within Yachay's perimeter of intervention, and to those members of those communities who organized themselves in the form of cooperatives and small companies to provide services to Yachay. As noted in chapter 4 they had to reorganize their lives around the intervention of the project in their own trajectories, and now after 7 years of having done so with great effort, and in many cases suffering, the government forces them to face a new wave of reconfiguration and uncertainty. Recently, this tension has caused people from those communities and organizations to protest and demand from the government a response with respect to what will happen with them in the future, and how the current command to liquidize the EP makes sense taking in account what they were forced to live through in the past few years for the cause of the futures promised in Yachay. (source: <https://lahora.com.ec/imbabura/noticia/1102225213/protesta-de-yachay-ep-genera-firma-de-convenio-en-quito> Last accessed 13-12-2019)

have been required to give more hours of class to existing faculty, and this has limited the time they have for research. The University has moved closer to the rest of the higher education system of Ecuador, beginning to generate alliances with other local universities, on the lookout for cooperation links and seeking to use the infrastructure of other universities while theirs remains stagnated or in delayed progress.

A significant event was the "critical" period that the University lived during June and July 2017 when Carlos Castillo rector at that moment of the University decided to dismiss several of the deans of YachayTech. Castillo is a Mexican mathematician with a solid career in North American academia ¹¹⁹, he arrived to Yachay in late 2016 just before the elections and had to adjust to the regime transition being YachayTech's rector. Based on a clash of visions about the model that the university should pursue in the contexted times of austerity, and particularly about the type of tasks and requirements that the deans of the university schools had to fulfil, Castillo decided to separate several faculty deans from the University. Among them: Paola Ayala, Vladimiro Mujica and Paul Baker left the University. Until then they were deans of the Physics, Chemistry and Geology schools respectively.

Among other things, the rector asked them to spend more time at the university, to teach classes and to adjust to a series of administrative measures that he and his team implemented since his arrival at the institution in November 2016. The model that Castillo pursued for the University was strongly inspired by the one that Michael Crow has implemented at Arizona State University, where he worked before going to YachayTech, during the past decade known as the new American university. One of the elements that Castillo sought to incorporate through this model was to be able to teach a large number of students without losing the quality of the education provided. From the perspective of other professors and deans, this could jeopardize the objective of the university to become a world-class institution as academics would have more and more hours to teach as the student numbers grew and less

¹¹⁹ <https://mcmasc.asu.edu/file/214> (last accessed 10-12-2019)

time for research. This was especially the case due to the lack of funds to bring new academics to the institution and the increasing workload of the current academic faculty.

The current absence of promised infrastructure increases the pressure and activates dependency on social relations. For example, many academics have had to do research in borrowed labs from friends, colleagues (nationally and internationally), make new alliances with local universities (which is difficult because many of these universities show resentment towards YachayTech), and change their research topics in order to fit what is available. Alternatively, simply stop their research activities and focus on administrative and teaching work. When the rector dismissed the deans, a media scandal ensued, in which Rafael Correa himself gave his support to the dismissed deans and former deans who gave their version in various media accusing Castillo of despotism. The scandal came to the magazine *Science* where several reports and letters of the actors involved were published¹²⁰, where each one exposed his position and even recriminated the magazine for publishing information without verification of both sides. All this was happening in the middle of the political transformation in which YachayTech's authorities have had to adapt and connect with the new public authorities of the national education system and readjust their budget and development perspectives.

Castillo's attempt to introduce the model of the new American university to YachayTech was both a mobilization of his own experience in ASU to the new setting of Yachay, as well as a way of keeping the University alive within the horizon of budget cuts for Yachay as a whole in the next years, as well as the need for YachayTech to start competing with the rest of the higher education system now that it didn't had the special status Correa set for it. The central idea was that the time in which academics in YachayTech could have privileges like researching without teaching, having all of their travel funds covered, spend more time outside of Ecuador

¹²⁰ See for example: <https://www.sciencemag.org/news/2017/07/plans-research-powerhouse-andes-begin-unravel> and Carlos Castillo's response: <https://science.sciencemag.org/content/357/6354/881.1> (last accessed 10-12-2019)

in other institutions than in YachayTech, among others, were coming to an end. Both because the model aimed to reach a much wider audience of students and every academic was asked to be involved in teaching, as well as having less resources available to sustain the university in a time of austerity. This would allow YachayTech to stand alone even if the rest of the project disappeared around it, in a way it represented the down-scaling process this chapter has described.

They have had to readapt not only to the conditions dictated by the national government in the aforementioned times of austerity but also to the limits generated by the presence of the national comptroller agency and to the special examinations carried out by them on Yachay. These examinations have further slowed down the construction and completion of the infrastructural works as many of the contracts, and unfinished buildings are under investigation and, according to Ecuadorian laws, they cannot be modified until the investigation is completed and official results published. As late as April 2019, some of the investigation processes themselves have stopped because the National Comptroller agency does not have funds to hire the required experts to conduct the necessary reviews on the buildings¹²¹.

For six months (between July 2017 and January 2018) there seemed to be a certain calm in the university. Relations with the new ministry of education authorities and the ministries of science and technology became less convoluted, and on several occasions, high authorities publicly said that they would give their support for the university and keep it open. In the words of Carlos Castillo, he was “able to adapt to the political demands of his position”, demands that he had not foreseen before his arrival in Ecuador. However, in January 2018, Carlos Castillo announced his resignation from the institution due to personal reasons, in addition to changes in Ecuadorian legislation that would reduce the top salary value for academics in the public sector. During almost two months, the university did not have a Vice-Chancellor until the 1st of March of 2018 when the University announced that

¹²¹ <http://www.laverdad.ec/laverdad/index.php/regionales/19-ibarra/622-yachay-contaminado-por-la-corrupcion> (last accessed 10-12-2019)

Eduardo Ludena, an Ecuadorian scientist with a long career in Venezuela, would be the new rector of the University. Ludena thus became the sixth rector (Vice-Chancellor) of the University in its six years of existence.

At present, the University operates with insufficient infrastructure for the number of students it has (around 1200) and with insufficient laboratories to carry out research. The current government has announced that for the following year the budget of the University would decrease by 17%, generating from now cuts in funds for maintenance and development (Hora, 2018b). Likewise, the rehabilitation and repair of the 5 buildings under construction that have been pending for years, which would include, among others, new laboratories, more classrooms and other operational spaces for the University, continue to depend on the allocation of the budget (50 million dollars according to Yachay EP calculations) by the central government for Yachay EP (Telégrafo, 2018). Assignment on which there is no clarity and which will depend in part on the negotiation capacity of the Yachay EP authorities with the central government, within a scenario constrained temporarily by the announced closure of Yachay EP in 2021 and in which the intermediate time the central government does not seem to have a clear structured plan articulated for the project in the years to come.

All this happens in a context of adjustment and austerity promoted by the government itself. The government has already included a rise in the cost of fuel, a budget planned for 2019 that was rejected by the National Assembly and that generated massive mobilizations by the student sector product of a general reduction of the education budget for Universities, and the resignation of education minister Fander Falconí. In fact, this has generated direct confrontations between the students of YachayTech and President Lenin Moreno as a result of his criticism of the University and the project. Both Yachay EP and YachayTech are constrained-by and attentive-to to changes in the central government and specifically to the decisions of the president and his relational infrastructures looking to the future.

6.6. Chapter Conclusions

In this Chapter, I have followed the developments that Yachay and actors connected to the project have experienced during the transition between the governments of Rafael Correa and Lenin Moreno. Similarly, I have traced how the actors in the project adapted and shaped the new conditions emerging after the new government came into office. I have tried to connect the understanding of expectations that I have been developing across this thesis with a problematization of the concepts of contexts and crisis. To do so, I have analysed an event before the elections that I consider very interesting with respect to the multiple temporal themes that one can analyse in it and what the event itself can tell us about the actors' relations to the future, the mobilization of expectations and the sense of changing contexts at stake.

The chapter aimed to close a narrative cycle that I did not expect to find when I started my research: Yachay followed a process of initial up-scaling from being conceived as a technical university and then re-imagined as a much more ambitious City of Knowledge, to then by later on down-scaled again into a much more restricted educational project with a strong focus on a technical University. This whole process also signified an up and down scaling of the expectations embedded in the infrastructures. At the beginning Yachay as a University was expected to connect Ecuador's higher education system with the elite universities of the world, its impact was imagined as being almost immediate – a process I described in temporal terms as a reduction in its latency. Later when it was up-scaled into a city of Knowledge it was not only associated with being the trigger of a change in the economic structure of Ecuador, but also being the greatest and most enduring symbol of Rafael Correa's government legacy. After a change in government, which ended up being a clash of visions and an escalating conflict between different contexting strategies, Yachay was critiqued, its funding reduced and its prominence for the government almost nullified. It was then surrounded with uncertainty with respect to its future but YachayTech, the technical university at the heart of the project, remains and has been able to find some stability in the waves of polemics and changes. The project has been

reconfigured constantly by the actors coming into it from different perspectives, mobilizing dissimilar relational infrastructural and contexting strategies.

The next and final chapter will provide general conclusions for the thesis and discuss future potential lines of research.

CHAPTER 7. Conclusions

This final chapter provides a general overview of the thesis and integrates the overall analysis. It reflects on the different conceptual elements highlighted throughout the thesis and examines some limitations of the research connecting them with future lines of work. Each chapter has focused on a different moment in the process of infrastructuring Yachay. Infrastructuring was defined in Chapter Two as an approach to infrastructures that underscores the multiple doings and the processes shaping an infrastructure in the making. That is, rather than treating it as a stable and finished object. The notion of infrastructuring was thus utilised to capture the various timescales entangled in the work of infrastructure-making in Yachay. Through the use of this notion, the thesis highlighted the design-in-use aspect of infrastructural work; i.e., it emphasized the active role of multiple actors – other than designers - in the building of infrastructures and their reconfigurations across time in specific locales (Pipek & Wulf, 2009; Pollock & Williams, 2010a). In this regard, each chapter has brought to the fore the specific actors and trajectories intersecting at a particular stage in the process. Moreover, across the chapters, I have highlighted the specificities of the dynamics¹²² I observed during my fieldwork while also drawing commonalities across the general narrative. My intention has not been to produce an exhaustive historical account of the project but rather to follow its infrastructuring process through different entry points that engage with both its past, in Chapters 3 and 4, as well as its development into the future, in chapters 5 and 6.

Even though it may be implicit, I explicitly want to mention that I ended my fieldwork in Ecuador in April 2018, and since then there have been significant events and

¹²² Across the thesis I have used the word *dynamics* to describe what was happening in Yachay and beyond at different stages. I have used this word because I think it conveys a processual character and thus a temporal dimension at play that resonates with my general focus on temporalities. Furthermore, it foregrounds a sense of motion not necessarily connected to equilibrium between its components, or assuming an already prefigured destination. Hence it works well within the approach of the thesis to infrastructuring through a BOAP framework. Moreover, dynamics is also a word connected to power and power-generation through motion ("Greek dynamikos "powerful," from dynamis "power" <https://www.etymonline.com/word/dynamic> last visited 02-02-2020), which resonates with the thesis' central notion of relational infrastructures in which power and power-generation is also a driving force.

profound changes in Yachay of which I do not talk specifically. I had to put a limit to my narrative and to the topics analysed in this thesis, and I decided to end the narrative with the events occurring during 2018 when I was still there. Even so, I have continued to follow the project through conversations with my interviewees and multiple channels of communication, which have informed my analysis. It has been challenging to choose a point where to conclude the narrative and the analysis, as the dynamics within Yachay and those surrounding it have been relentless. In view of this, I would like to continue following the project in the future and continue to use Yachay as a generative site for theorizing and drawing attention to the significance of Ecuador, and Latin America more generally, for STS research. Indeed, this first exploration of the project through this study has allowed me to take a plunge into the complexity of Yachay and has brought to my mind future potential lines of research in Yachay and beyond. Some of them are discussed in this chapter.

The chapter is divided into four sections. The first one describes the main narrative and theoretical points that have driven each empirical chapter and concludes by reflecting on the overall journey of Yachay until 2018. The section also describes the main empirical findings of each chapter that have supported the theoretical contributions developed in the following section. The second section combines the theoretical reflections drawn from the literature on expectations and infrastructures in STS with the reflections I have developed in light of my fieldwork using empirical evidence from the different chapters to support it. Additionally, this section describes what I consider are my contributions to knowledge. I have summarised the most relevant contributions of the thesis in five main points around three corresponding conceptual areas. These are, 1) infrastructures, 2) expectations, 3) contexts, 4) a section discussing the utility of the methodological approach and the theoretical contributions to analyse cases like Yachay and understanding the associated sociopolitical dynamics of Ecuador. In addition, a third section highlights how the overall STS-framed analysis contributes to STS and disciplines studying similar issues. This section pays particular attention to how my analysis is relevant for research based in Ecuador and Latin America, and why taking the region seriously is important

for STS. The five areas are connected by the temporal approach I have pursued. Finally, the fourth and final section reflects on the research journey, describes the limitations of this research and defines potential future lines of inquiry.

7.1 General Overview

The thesis has explored the temporalities involved in the infrastructuring of “Yachay, the City of Knowledge” throughout its multiple reconfigurations. The main goal was to follow the process of infrastructuring Yachay from its initial design into its implementation and subsequent developments. The research design was inspired by the BOAP approach; i.e., it investigated the dynamics of the project throughout diverse socio-technical relations and settings wherein the project evolved at different stages. The thesis has illustrated the benefits of examining expectations in connection to multiple social trajectories and contexts, to study Yachay and, potentially, other similar techno-cities. In this respect, while the research focused on the 10-year government of Rafael Correa and the initial stages of the administration of his successor Lenin Moreno, it also insisted on the importance of tracing the multiple temporalities at play. What I mean by this is that the political situation at every studied stage of the project was analysed by bringing to the discussion trajectories with different durations and less visible pasts and futures configuring that present moment.

The thesis narrates the infrastructuring of Yachay throughout four different stages. First, in the course of its scaling-up from a technical university to a City of Knowledge in Chapter 3 (2006-2011). Second, during the material implementation of some of its fundamental physical infrastructure in Chapter 4 (2011-2012). Third, throughout key changes in the operation of its two central institutions in Chapter 5 (the public enterprise Yachay EP and the University YachayTech) (2012-2017). And fourth, during the radical reinterpretation of Yachay that followed the change of government from Rafael Correa to Lenin Moreno in a very different mobilized context in Chapter 6 (2017-2018).

The first empirical chapter, Chapter 3, focused on describing the historical backdrop and temporal dynamics within which Yachay emerged. Yachay was first conceived as a Technical Research University that would compete at an international level of academic excellence as soon as its construction was finished. However, later on, it was up-scaled into a City of Knowledge. Initially, it was not named Yachay. The conceived university of excellence was one of four emblematic universities the government had planned to construct as part of a general reform in Higher Education. The chapter followed the actors, practices and events involved in the up-scaling of Yachay, bringing to the forth the roles that expectations had in the intragovernmental negotiations and in convincing the then president of Ecuador, Rafael Correa, to support and commit to Yachay. The chapter, like the thesis as a whole, highlighted the past historical trajectories involved in the formation of expectations around the new project. More importantly, it proposed an understanding of expectations as interfaces between pasts and futures, to avoid over-focusing on the present and future of the socio-technical projects while neglecting their past.

This chapter had three main empirical findings. First, while mainstream understanding of Yachay portrays the project as being conceptualised and created by Rafael Correa himself, thus personalising the project in his figure, my evidence shows that other actors were involved in the process of thinking, shaping and framing the project long before Correa gave his support and approval. This was the case of officers within the government who influenced and designed Yachay's early configurations. This point is connected to a second one. In contrast to academic and mainstream representations of the project that have described it as being conceived from the start as a City of Knowledge, I have shown how the project was up-scaled from being a technical University with a research orientation into a City of Knowledge with higher ambition and more intensive requirements with respect to funding and political support. Thirdly, the chapter shows how expectations played a key part across these processes, not only by offering representations of future capabilities, as the literature on expectations correctly suggested, but also connecting and shaping those futures with respect to representations of the past. This connection between

past and future happened at personal and collective levels. In this sense the evidence presented in chapter three pushes the discussion around expectations forward by providing empirical data about how expectations mediate past and futures, in relation to both the development of public policy and its implementation on the ground. This was made possible by my methodological approach that aimed to follow Yachay's life from the past and trace how it changed over time along with the actors who were involved at different points in time. If I had focused only on the present of Yachay when I first arrived to conduct fieldwork most of its complicated up-scaling process and internal negotiations to gain support would have been left out of scope. As well as interviews and observations, I adopted some methodological elements from historical research, such as archival searches and analysis of archival materials in order to reconstruct the project's story since its earliest forms.

The second empirical chapter, Chapter 4, shifts the focus of analysis to the initial process of implementation of the project, starting with the selection of the site for the development of the project, which resulted in the choice of Urcuquí. In turn, Urcuquí was projected into a 'brighter future' that justified the expropriation of 4462 hectares of land to build the new city. The narrative subsequently moves to the processes of repair and maintenance conducted in the buildings of the old Hacienda on the base of which the university at the heart of the project would eventually operate. The chapter explored the intersection of multiple temporalities in Urcuquí at these points in time, including the arrival of Yachay into the scene. This included the long-lasting historical inequalities regarding land accumulation, ownership and decay in the region, to which Yachay became coupled too, as well as the expectations materialized symbolically and physically in the infrastructures emerging from the processes of repair. The chapter dealt with the entrance into the project of actors who were not public servants, such as the communities affected by the implementation of Yachay and the hacendados who opposed the project and the futures being promised. In short, the onus of the analysis was in making visible the temporal complexity that characterized the infrastructuring processes while arguing

why it is academically sound and socially coherent to study pasts and futures in tandem when analysing innovation projects such as Yachay, particularly in regions of the world intensely marked by deep historical injustices.

The second empirical chapter had two main empirical findings. The first one is connected to how international influence over Yachay has been presented in the literature. The few academic papers focused on Yachay have described the project as an instantiation of an international trend and highlighted in this connection the influence of the Korean IFEZ team as the main driving force behind Yachay's implementation. The chapter instead offers a different perspective: by focusing in the infrastructuring of the project it shows that the influence of the Korean team was heavily negotiated and mediated by several factors among them the local history of the place and its people's struggles over land, the government's own understanding of what Yachay meant and how the infrastructures should materialize and convey that meaning, and by the preference of repair over construction from scratch that the Ecuadorean actors guiding the project had opposing the initial recommendation of the IFEZ team. In short, the chapter shows how the Korean influence was one among many factors and actors shaping the infrastructuring of Yachay. A second empirical finding is connected to the repair process of the old Hacienda Buildings; in this case, the chapter provides evidence of how expectations intersect with existing infrastructures and practices of maintenance and repair. In the case of Yachay, the repair process connects the long duration historical struggle over land and ownership, with the materialised implementation of a future-oriented project. Through the repair process of the old buildings the government officials mobilized their own expectations concerning how the place's past would connect with its future, and how this resonated with the government's understanding of Ecuador's pasts and futures more globally. Even so, the chapter also shows this is a contingent process depending on the actors' perspectives and how the infrastructuring process changes over time. These points draw a clear distinction with representations of Yachay as being only future oriented and being involved in building everything from scratch. Again, the observation and analysis of these processes that happened before

YachayTech was inaugurated was only permitted by the historical sensibility that shaped my research and by the associated BOAP approach that aims precisely to trace these transformations and subtleties across a project's life without assuming the infrastructuring is done once and for all. This chapter also contributes to strengthen the literature on smart cities and cities of knowledge by providing empirical evidence of how these projects are entangled within a longer political dimension and also how the future orientation of the projects intersects with the history of a place in specific ways like getting entangled in the historical modes of land distribution and use or relating to the already existing infrastructures. The chapter shows how understanding the struggles triggered by the implementation of these projects is aided by an analysis of how past, present and futures interact during such implementations. A central node of this interaction is the one established through processes of repair, which may be often overlooked when studying large scale infrastructures in the making by favouring the novel components.

The third empirical chapter, Chapter 5, explored the dynamics in practice of both Yachay EP and YachayTech. It did so by describing, on the one hand, the main events and principle elements shaping the involvement of a new set of actors in Yachay EP and YachayTech (students, lecturers, academic authorities in YachayTech, and Héctor Rodríguez along with the new administrative actors connected to the EP). On the other hand, it also explored the changing configuration of the relations between the actors who were already involved in the project. The motivations of academics, students and administrative authorities of YachayTech for joining the project were explored, highlighting the influence of the Caltech group headed by José Andrade in the shaping of the University at that point in time. Similarly, the narrative tracked what was happening within Yachay EP, the continued construction of infrastructures for the project, and the management of the challenges arising. The chapter focused on discussing the concept of *relational infrastructures* in connection to expectations and the evaluation dynamics established around them during this moment in the life

of Yachay. I have defined relational infrastructures as sets of relationships that serve as base or foundation for the establishment and maintenance of new relations. Relational infrastructures are made visible when taking into account trajectories, commitment and different scenarios of action for various groups of actors.

Empirical chapter 3 has three main empirical findings. The first one is the portrayal of Yachay EP and YachayTech's operations in practice focusing on the multiple temporalities coming together. Previous accounts of Yachay have focused more on the overall results of the project rather than on daily dynamics and internal temporal structures. My evidence shows the complicated temporalities public employees had to deal with and how the multiple rhythms and demands linked in the project ended up causing a dynamic of compressed acceleration. The evidence presented suggests that, rather than being generated by a specific group of actors from the government, this dynamic was influenced by the whole ecology of actors including governmental actors, the media, non-governmental actors and wider tensions from within the government itself. The chapter shows how expectations that were positioned during the beginning of the project ended up becoming detrimental as they became subjected to increasingly demanding accountability. These elements had not been portrayed before with respect to Yachay. Secondly, the chapter also provides evidence of the internal divisions in operation and dynamics between Yachay EP and YachayTech. These two institutions have been often misrepresented as being the same, thereby concealing differences and tensions between them. The chapter shows how these differed in practice and the consequences this had for the project's development. Similarly, I have captured the perspectives of diverse actors involved rather than collapsing all agencies into the institutions themselves. Thirdly, the chapter provides evidence of the importance of previously sustained links and relations on the development and participation in an infrastructural project such as Yachay. I offer the term relational infrastructure to capture this dimension through the way these already existing relations appeared in Yachay, influenced its dynamics and were a key component of how certain actors related to the settings beyond the project. The evidence suggests that this concept

may help capture dynamics that are very common in Ecuador and in infrastructural projects across the region. My focus on Ecuador and Latin America makes the relational dimension of infrastructures more visible, but this is not a dimension reducible to the region. Moreover, the concept of relational infrastructures is different to that of assemblage or network, which are commonly used in the literature on infrastructures precisely because it implies a layering of relations, and evokes the connected power dynamics at stake. In a way, as infrastructures themselves it implies a temporal layering too as one element serves as foundation for others and predates them, it highlights how the past in different forms is quite relevant for present dynamics. Observing these relations was again made possible by the longitudinal observation of the project proposed by the BOAP, which allowed me to observe, at least partially, the actors that came together in it at different stages and how their own trajectories influenced their activities within Yachay.

The fourth and final empirical chapter, Chapter 6, explored both the uncertainty surrounding Yachay approaching the 2017 March presidential elections and the socio-political changes that unravelled after Lenin Moreno won the presidency as a candidate of Alianza País. I described how the electoral climate influenced the dynamics in Yachay. But also importantly, I also discussed how within Yachay some actors also tried to influence the elections through the announcement of an enormous private investment in the project. Such investment was supposedly coming from a company which claimed to have ties with both Tesla and Hewlett Packard, and the investment consisted in the creation of a huge electric car factory in Yachay. I analysed the event and the implications that followed drawing on my approach to temporalities and the positioning of actors both with respect to the future and to the reconfiguration of their own past trajectories embedded in the project. Later, the onus of the analysis was set in the contexting practices used by Lenin Moreno and his allies to break with the previous government, declare a national crisis and mobilise austerity-oriented changes across the public sector. In

this setting, Yachay was being portrayed both as a symbol of the “pretentious failures” of the previous government, hence a justification for the crisis narrative, and as a site for the reforms to be applied and widely publicised. The conceptual framework I had built during the previous chapters helped me to account for the changes brought in by Moreno’s government by focusing on the reconfiguration of Yachay as an infrastructure in two related ways. One, with the entrance of a new administration to the EP, and second, more broadly with the readjustment of the temporalities at play. For example, by altering the existing expectations and political support for Yachay, as well as changing the work rhythms in the EP. The chapter critically analysed both the idea of contexts as an external neutral reality and the context of crisis in particular.

This chapter had two main empirical findings. It first maps what happened in Yachay during the change in government from Rafael Correa’s administration to Lenin Moreno’s term in office. Previous academic accounts of Yachay had focused on Correa’s government and on the struggles of the project to fulfil its promises. The empirical account presented here also follows the new set of actors that arrived to the project and provides evidence of how both of these influenced the infrastructuring of Yachay and ended up downscaling the project. The chapter describes how expectations were involved in these processes by mobilising new interactions between pasts and futures in the shape of critiques to the previous administration, strategic changes in the planning of the future of the project, legal disputes that involved the previous public officials in charge of Yachay EP and public shaming of Yachay. A second empirical finding is the description of the way in which Lenin Moreno’s government positioned a new context for the country and for Yachay, by mobilising a critical reading of Correa’s government and legacy. In this way Moreno positioned the context of crisis as a dominant driving force for public policy. Drawing on evidence observed in Yachay and interviews with other public officials from other areas of the state, the chapter proposes the concept of *contexting* as a way to capture the shaping of contexts and their relation with expectations. The chapter provides evidence of how this has worked in Ecuador’s government and how

Yachay both influenced and was influenced by this new context. Within the academic field of STS there is increasing preoccupation with a critical analysis of specific contexts and the chapter provides empirical evidence of how one context was positioned and actioned to generate multiple changes in Yachay and beyond. Similarly, the chapter analyzed how crisis was used in the setting of Yachay and the associated social and political spheres, this providing empirical evidence from a setting beyond Europe and North America of how one can engage critically with such a concept within an STS perspective. The analyses of context, temporalities and crisis offers a reading of Yachay that goes beyond ideological struggles between the figures of Correa and Moreno. This is a missing link in the existing literature on Yachay.

Altogether, the analysis illustrated how expectations were used in connection with various dimensions of the infrastructuring process throughout these different entry points, to mobilize futures and pasts that would end up shaping the concept, scale, and ambition of the project. The literature on expectations was combined with the literature on infrastructures to provide a more systematic understanding of the dynamics involved in the emergence, implementation, and reconfiguration of the project. One of the goals of this thesis was to show that in the case of Yachay, as in many other similar cases, expectations are gradually embedded in the infrastructures that comprise it. This shaped the understanding of Yachay as an infrastructuring process that develops over time without a clear anticipatable culmination, where people, institutions and contexts at play in the project are also changing.

Furthermore, the case of Yachay analysed here, shows that futures should be studied hand in hand with the histories involved in the contexts where they emerge, the trajectories of the people who construct them and the ways pasts are represented-actualized in the present. Futures are part of broader temporal horizons or temporal landscapes that are also composed of pasts and emerging presents, which are mobilized strategically. The evidence from Yachay highlights the complex temporal dynamics involved in infrastructural projects, especially in cases in which futures are explicitly political, and the state plays a prominent role. Additionally, the focus on

expectations, as one of the critical elements involved in the processes of infrastructuring, from the initial design into moments of maintenance–repair or breakdown-decay, offers a different model of analysis of Yachay that challenges the success/failure readings of the project.

Regarding this last point, the thesis has problematized how representations of the process which generated Yachay as a simple importation or ‘application of a foreign model’ (Chavez & Gaybor, 2018; Fernández González et al., 2018) neglects a series of constant reconfigurations rooted in specific actors’ trajectories and contingent negotiations. Elements of analysis that, as has been shown throughout the thesis, have been crucial in the history of the project. Mainly this was discussed in Chapter 3 with the story of up-scaling of Yachay into a City of Knowledge. Furthermore, Yachay’s emergence and reconfigurations cannot be explained either as the sole action of the Ecuadorian government, primarily if this is understood as a homogeneous monolithic entity. Instead, focusing on the different practices involved in the infrastructuring of Yachay across time can address the constant work required to sustain specific representations of pasts and futures, in the form of expectations, narratives, future-objects, infrastructures, and relations. By focusing on Yachay as an infrastructure, its dynamics can be studied as the converging point of various actors who enact different contexts, temporalities and expectations. Moreover, the framework of this thesis also allows observing how the project affects and changes different historical and personal trajectories, rather than only following these trajectories as factors shaping the project.

Far from being a simple export of a Korean economic model, the history of Yachay shows a constant readjustment of the project according to the changing contexts, political times and the actors involved. The evolution of the project occurred within the government simultaneously to other transformations and political actions such as the Prometheus project (which links high-level academic researchers living abroad to Ecuadorian educational institutions), the scholarships programmes, and a general reform in the higher education system. The project did not emerge from thin air. It was connected from the start to the political transformations, and to the contingent

ways in which Correa's government understood and mobilised pasts and futures. The interaction between Korea and Ecuador goes beyond Yachay, and the influence of the Korean model in Ecuador surpasses the Correa administration. As it has been highlighted across the chapters, the influence of the Korean team of IFEZ was restricted and negotiated. Many of the elements contained in the master plan, which may be the most significant source of direct influence, were reinterpreted, ignored, or abandoned in order to pursue other lines of action. The divergences with the IFEZ team were visible for example in the events described in Chapter 4 when the Ecuadorian authorities decided to repair and maintain the buildings of the Hacienda instead of demolishing them as the IFEZ team initially suggested. All these intricate details become evident when looking at the project through a longitudinal scope, such as the one proposed by the BOAP approach used for this research (Hyysalo et al., 2018; Pollock & Williams, 2010a; Williams & Pollock, 2009). This has allowed me to understand the life of the project through the multiple reconfigurations it has experienced across different settings.

Furthermore, this approach was used to avoid forms of totalization of data generated through a single-entry point as a sound source to generate judgements of the project as a whole. If we collapse the complexities involved in technological change into a deterministic narrative that portrays sociotechnical phenomena in a crystallized state, be it of a victorious utopia or a disastrous dystopia, we can lose sight of the current and potential work of repair, care, reconfiguration, and maintenance (Jérôme Denis & Pontille, 2015; Graham & Thrift, 2007; Haraway, 2016; Philippe Sormani et al., 2016). Moreover, the danger with such a narrative is that it can portray the idea of a need to erase or dismiss everything that has been done so far in order to start all over again, which has fuelled the obsession with futurity and novelty surrounding innovation and technology studies. A more careful analysis of the situated practices, knowledges, histories, expectations, and interactions over time, may allow us to generate openings for knowledgeable intervention and accountable interaction with the multiple stakeholders to improve the web of relations that compose the

sociotechnical projects at stake. The next section reflects on these topics more generally while drawing on the case of Yachay.

7.2 Theoretical and methodological reflections

This section explores the theoretical and methodological points made throughout the thesis and connects them to the literature around infrastructures, expectations and temporalities. I also make explicit the connections to how the thesis approaches these different elements of sociotechnical assemblages in a way that can inform current understandings in STS. Every chapter of this thesis has taken inspiration from the existing literature around my central themes, namely infrastructures, expectations and temporalities. By drawing on the evidence collected from Yachay, I have shown how these literatures can complement each other, how it can be useful to analyse settings such as the one I selected, and how I think my case study contributed to the current understandings in each field.

In this sense, the first and second empirical chapters, Chapters 3 and 4, worked with the concepts of expectations and infrastructures, exploring how these intersected in the early stages of Yachay both in its design and in its initial implementation. Based on the data, I proposed ways of exploring the roles that expectations had in infrastructuring the project as well as in the specific practices of repair conducted to materialize Yachay. The third empirical chapter, chapter 5, drew on the literature on infrastructures and temporalities. Particularly, through the concept of compressed foresight, it addressed some of the challenges faced by the actors and the project as a whole when Yachay became operative while still undergoing infrastructuring. In addition, I developed the concept of relational infrastructures based on the evidence I encountered in Yachay to bring to the fore a dimension of infrastructures I consider is not sufficiently addressed in STS. The fourth and final empirical chapter, chapter 6, reflected upon the notions of contexts and crisis through the analysis of how both were used in Ecuador during Lenin Moreno's government, especially concerning Yachay. By drawing on Kristin Asdall's work in STS around contexts-in-action and contexting (Kristin Asdal, 2012b; Kristin Asdal & Moser, 2012) and reflections from

other fields around crisis, I applied and developed the notion of contexting for my case study. Contexting intends to capture the activity required to shape contexts, their deployment and the connections these elements have with infrastructures and expectations.

Accordingly, the following paragraphs will reflect in detail on my contributions to knowledge based on the aforementioned discussions that have guided my investigation into the life of Yachay. In what follows there is a section each for expectations, infrastructures, contexts and a final section devoted to some empirical considerations around socio-technical projects, public representation and temporalities, drawing on Yachay and Ecuador as valuable settings for reflection.

7.2.1 Expectations

Across the thesis, one of the main theoretical and methodological arguments has been that expectations can be understood as interfaces between futures and pasts rather than as representations that are just oriented to the future. This means, on the one hand, recognizing the historical trajectories of expectations, as I have tried to do in resonance with other investigations around expectations (Brown & Kraft, 2006; Brown et al., 2006). But also, on the other hand, it means indicating that pasts and not only futures are at stake in the dynamics of expectations. Through expectations, actors shape specific ways of observing, understanding and mobilizing pasts and futures that give rise to particular presents, often connected to affordances for action. For instance, Correa's approach to Yachay was both shaped by particular representations and positionings with respect to Ecuador's economic and sociopolitical pasts, as much as it was connected to the representations of the future capabilities and socioeconomic conditions that Yachay would potentially enable. Both shaped the government's actions in the present, enabled the investment of significant resources in Yachay and influenced what was later demanded from Yachay.

Hence, expectations were studied as interfaces between pasts, futures and presents rather than just focusing on future-orientations connected to a general historical

trajectory, as some existing literature has portrayed them. The idea I presented is twofold. First, the actors draw on their partial and situated past experiences to imagine and generate specific futures. Second, their relation to the past is for these same reasons as problematic for actors as the future is. Let me elaborate further. The past can only be partially observed and experienced. It is shaped by the changing present conditions. It is enormously complex, so it is not exhausted by partial representations. Therefore, the past cannot be taken for granted as an already exhausted and stable factor. This condition also shapes expectations because actors relate to expectations that are infused with their own personal past trajectories. For instance, Yachay was not only the embodiment of a specific future imagined by its designers, but it was also a future in which many of the past trajectories of the country came to an end and were outdone. Moreover, it embodied a future that in itself implied contesting other futures emerging from the social, political and economic pasts of Ecuador.

Similarly, by trying to understand expectations as interfaces between pasts, futures and presents, I also tried to avoid reducing expectations to instruments that can be easily turned into resources for political action or economic venture. Indeed, expectations convey this feature, at least partially. However I have tried to stress that, additionally, expectations are part of broader timescapes (Adam, 1998, 1999; Birth, 2012a). Scholars have described timescapes as clusters of temporal elements that interact with one another, many times in conflict. Timescapes are constituted by entanglements of specific rhythms and temporalities related to “biological processes, environmental cycles, and cultural constructs” (Birth, 2012a, p. 32) and are significant for particular communities of practice. In this sense, I have tried to connect how expectations interact with other temporalities in complex ways, and how the specific socioeconomic trajectories at play in Yachay, and more widely in Ecuadorian politics, are critical in this respect.

Furthermore, expectations are generative and can never be controlled entirely by the actor or collective who created them. Expectations are reinterpreted continuously, actualized in the midst of the changing present and maybe even mobilized against

their creators as in the case of Yachay's Tesla scandal (Chapter 6). Additionally, expectations enable relations between actors, collectives, territories, and materials that could not happen without them. In this sense, expectations stimulate, motivate and trigger future-related and past-related reflections on a multiplicity of actors that would not necessarily be present if the given expectations were absent.

Take, for instance, the case of the scaling up of Yachay from a Technical University to a City of Knowledge. If the early expectations supporting the project of the four emblematic Universities - specifically the expectations of a revolutionized Higher Education System - were not already present in the government's agenda, then the subsequent critical reinterpretation of those expectations in the scaling up would not have been possible. The scaling up occurred precisely on the basis of those former expectations but readjusting them to a more ambitious project that would take more variables into consideration. The City of Knowledge reinterpreted the previous expectations of an elite university by pointing to the specific trajectories of Ecuador that were not taken into account. Expectations, in this sense, enabled the reconfigurations of the project.

Furthermore, if we accept that expectations are a crucial part of the infrastructuring processes, then the tools that have allowed us to sustain and improve the use of infrastructures across time, such as those of maintenance and repair, could also be applied to our approach to expectations themselves. Understanding expectations as a fundamental component of infrastructuring practices has allowed me to discuss how expectations, and not only infrastructures, require maintenance and readjustment in the face of breakdown or decay. Dealing with the constant tension and gap between initial expectations and contingent implementation is a growing challenge for sociotechnical projects and emerging scientific fields (Galanos, 2018; Schyfter & Calvert, 2015; Van Lente et al., 2013) and Yachay is no exception.

Some crucial challenges to consider in such complex projects to navigate them more robustly are: acknowledging uncertainty and the risk involved for a variety of actors; developing coherent relations of accountability and developing practices that take

into account the gap between expectations and outcomes – all these while remaining open and adaptable to the dynamic forces of breakdown/repair. These would constitute practices of maintenance and readjustment of expectations, which in contexts of high socioeconomic volatility may be fundamental to sustain public ventures and valuable policy across time. A key component here is to be clear about the uncertainty, desires as well as fears, and the risks involved for multiple actors within specific expectations. This is particularly the case for projects of the size of Yachay that influence not only the actors who will become an integral part of them but also actors whose trajectories become at stake willingly or unwillingly (e.g., the communities and Hacendados in Urcuquí).

Yachay was developed in a context of enormous expectations, and high internal and external pressure. However, it was also developed in a timescape that allowed limited room to make mistakes or rollback, and in a legal framework that was not prepared to facilitate the generation of a project of these dimensions and complexity, and at such a speed. Expectations themselves can have a long life. In an initial phase they may have generative effects, but as they grow and become institutionalized and materialized in infrastructures, they may come back with a demanding character, putting pressure onto their generators. Because of this, it is essential to provide a temporal dimension to the study of evolving expectations and see how they mutate within intersecting relational infrastructures.

Contrariwise, the centralization of decision-making in this kind of projects, a top-down view of policymaking in general and innovation-oriented projects like Yachay in particular, obscures the collective risk and overlooks the irreducible uncertainty they work with. Even worse, such an approach may end up turning expectations against the projects themselves. This is especially true in the current international setting in which current investments and the perceived need for future investments in infrastructures have reached an all-time high globally. And simultaneously the risk of building infrastructures that are not socio-technically resilient and socially coherent in the midst of a swiftly changing world has grown equivalently (Penny Harvey et al., 2017; Thacker et al., 2019). With this in mind, understanding the role

of expectations as interfaces through which pasts and futures are mobilized and actualized in the present, may prove a key component in understanding technological change and the dynamics of infrastructuring across multiple settings.

My theoretical chapter (Chapter 1) proposed that my approach to expectations would be an extension of the current understanding in the field that frames expectations as oriented to the future. My approach aims to complement that focus with a study of how expectations mediate pasts and futures, giving rise to meaningful and actionable presents. This understanding has guided my analysis throughout the thesis. Now, based on the evidence I collected and analysed, I can describe four ways in which expectations mediate pasts and futures in analytically interesting ways. First, my fieldwork showed that they are a fundamental resource in the transformation of personal readings and understandings of pasts and futures, into collective resources for action, organisation and collective action. This mediation can be illustrated by how Rafael Correa turned his personal experiences and understandings of Ecuador's higher education system into public policies oriented to transform it into the future. Based on very personal past experiences he, along with his team and allies, constructed a collective vision of how the education system should work and triggered several transformations to achieve that. Expectations in this scenario stabilized particular ways of observing pasts and futures, turning those readings into public documents, programs and policies. Yachay was one of them. This was also the case during Yachay's upscaling process from a technical University into a City of Knowledge. One key actor in that process was the anonymized public Advisor who critiqued the initial plan for the technical University and drawing on his personal experience and his own understandings of Ecuador's pasts and how its future should look like, and suggested significant changes to the initial concept that ended up transforming the technical University into a whole city devoted to innovation and research. This was made possible by the way in which, through mobilising expectations, he convinced and enrolled other officials and eventually Rafael Correa to share his understanding of what the country was missing in order to finally develop. Hence, I can suggest that expectations modulate pasts and futures in the

process of turning personal experiences and understandings into collective resources. In this sense, I have tried to connect how expectations interact with other temporalities in complex ways, and how the specific socioeconomic trajectories at play in Yachay, and more widely in Ecuadorian politics, are critical in this respect.

Second, expectations also mediate pasts and futures through visualizations and images. I observed this when going through the different visualisations and presentations that were made of the project at different stages in its life. For example, in chapter 3 I presented several images of the visualisations created of the land of Urcuqui being occupied by future buildings belonging to Yachay (see images .###.). The interesting aspect is that in one image we can observe past and future juxtaposed together, with no clear transit between one and the other. The land was presented in the present as being occupied by the future of Yachay. Similarly, I also presented images that contain a digital design of a future student accommodation fused with the old workers' house crumbling apart as they had been neglected and allowed to fall into disrepair (see figure 16). This image was used for internal meetings and in it we can again see the past and the future presented together allowing the participants to observe them in tandem. These were materialisations of expectations in images and objects that show a temporal mixture that is quite compelling for authorities examining advances or strategic planning. Thus images are great resources to analyze expectations and the different uses they are given, as they show the precise modulation of pasts and futures.

Third, expectations also mediate specific and contingent understandings of pasts and futures through infrastructures themselves. This was the case in the analysis I conducted of the repair process of the old Hacienda Buildings in chapter 4. The authorities in charge of Yachay decided not to follow the suggestion of the Korean team to demolish all the buildings that existed in the site, but alternatively decided to repair and maintain them, giving them a new meaning and a new use. This repair

process implied a recognition of the history of the buildings and the materialization of an intention of their use in the future. This was heavily charged with political and social meaning as the government wanted to express through the repair process the transformation itself of the productive matrix that became a central promise of Yachay. As one of the respondents told me: the intention was to transform a once private-oriented, manual labour-centred, aristocratic power-focus into a public-owned and oriented, research-based, academic power house. This was embedded into the repair process and into the infrastructure itself: for example, the old Hacienda style of the architecture and facade was combined with quotes from revolutionary characters and left wing thinkers. Similarly, the maintenance of the infrastructure was used to convey power and importance, and the flux of power and prestige from past to present and future. Understanding expectations as a fundamental component of infrastructuring practices has allowed me to discuss how expectations, and not only infrastructures, require maintenance and readjustment in the face of breakdown or decay. During this repair process, the old mill, once a symbol of innovation and economic wealth, was kept and became part of YachayTech's library. Through expectations the government proposed a meaning for the infrastructuring process of those buildings, and this was contested as other actors did not share the visions of pasts and futures of the governmental actors. The key aspect is that expectations can become materialised contingently in infrastructures, embodying specific ways of preserving or destroying pasts, and constructing futures.

Finally, expectations also modulate pasts, presents and future in connection to contexts and contexting practices. In my last empirical chapter I analyzed the change of government from Correa to Moreno, both being part of the same party, being allies and apparently close ideologically. What started as a victorious continuation of a political process ended up becoming a controversial rupture and an ongoing conflict. In this process the mobilization of a new context played a key role and expectations were important by connecting pasts and futures in at least two

respects. First, by altering the interpretation and activities around the expectations and contexts that were already in place. This is, by altering the content of both.

Secondly, by altering the understanding of what lay in the past and what in the future. This is by changing the frontiers of where or when context begins and texts ends. In a way, expectations help defining what lies within the current moment and what is past and thus can be interpreted as inalterable, as lying outside the text but influencing it. A basic component of what a context is can be defined precisely by how expectations are calibrated and stabilized in it: what is the past in a given moment, how should we interpret it, what forces or invites us to do in the present and what does this imply for the futures at stake. These were all elements present in how Moreno reinterpreted Correa's 10-year government, what he considered his ongoing extended present, no longer as a revolutionary and progressive process but rather as a corrupt, wasteful and dark period. This reinterpretation implied first observing a significant part of the political process no longer as a continuation of an ongoing present but as something inherited from the past and laying in the past. Correa's government was set as the backdrop for Moreno's actions, as already in the past. Yachay was no longer seen as Ecuador's most important project in the last century but as a waste of resources, a niche for corruption and a megalomaniac illusion sold by Correa.

This did not leave the futures untouched, and the electoral victory that the previous government had interpreted as a perfect moment for strengthening and deepening the advances that had been achieved in Correa's term became a setting for crisis, austerity measures and the decomposition of several of the main public policies of the previous government. This constant recalibration of pasts and futures under the light of crisis and political rupture has characterized Moreno's government from 2017 till 2020. Expectations changed drastically, both pasts and futures were interpreted through other lenses and as a result crisis was stabilized as the new context for Ecuador. Public policies oriented towards cuts in public investment and generalized austerity were mobilised in Yachay, and throughout all the state, in order to "prevent" a worse future from happening, and continue to be implemented up until

2020. In short, my evidence shows that expectations play a crucial role in the delineation of contexts and their mobilization, particularly in crisis as context.

Concluding I can now argue that I have contributed to the study of expectations within STS by providing empirical evidence of how pasts and futures are modulated through expectations and arguing why an extension of the current understanding of the term to include past components is vital for the field.

7.2.2 Infrastructures

Throughout the thesis, I have explored several moments in the life of infrastructures and how infrastructuring processes of a specific project, say Yachay, operate sustained by already existing infrastructures of different kinds. As key authors in the field have highlighted, infrastructures are nested on other infrastructures; it is infrastructures all the way down (Star, 1999; Star & Ruhleder, 1996). This has been highlighted in contemporary studies, for example with the notion of "multinatural infrastructures" (Jensen, 2017) that points to highlight how dynamic elements of nature like dried riverbeds, bacteria or trees become entangled with other elements of infrastructures such as roads or sewage systems. As a result, their own lives become entangled with one another, nested in ways that make it very difficult to reduce infrastructures to human or not-human. In the case of Yachay, I have not focused on the non-human elements explicitly, but I have tried to highlight the nested character of infrastructures.

For example, in Chapter 3 I highlighted the normative and political changes operated in the Ecuadorian state that preceded Yachay and became its foundation. For example, the 2008 National Constitution, the entanglement of the buen vivir paradigm in it, the National Higher System Reform (which was commanded by the constitutional process) that would end up producing a new Organic Law for Higher Education (LOES), among others. Even before being materialised physically in Urcuquí, the government committed to Yachay, linking it with legal and public policy-oriented structures that would institutionalise it increasingly, and potentially protect it across time. These elements were explored throughout Chapter 3, and I think they

constitute valuable insights into the making of an infrastructure before the more obvious physical or material elements are constructed, especially in the setting of a government being the primary driver of an innovation project. One of the issues that emerges from these findings connected to my empirical evidence is that when considering government-led infrastructural projects studying this aspect of the infrastructuring process becomes quite relevant as it is often normative and policy transformations which sustain and allow the later material implementation of infrastructures. This stage of legal infrastructuring is fundamental, as it is one of the ways in which governments both enable the emergence of ambitious infrastructural projects and also protect them legally looking into the future.

In the case of Yachay, this was achieved by connecting it directly to the national constitution, including Yachay as a strategic project within the national plan for development, by including YachayTech in the organic law for higher education and including Yachay in several presidential commitments. As described by the reconstruction of the history of Yachay's emergence I provided in Chapter 3 the project's infrastructuring trajectory was not linear, and it became increasingly more ambitious as its concept grew in scope and in the dimension of the promises connected to it. As proposed in the methodological chapter, Chapter 2, I was able to trace this development across spaces and times, by tracking several durations entangled in the project. Among these were the individual influence of actors coming in and out of the initiative, the way changes in the positioned contexts influenced the project and vice versa, and finally how institutional changes in Ecuador's government and in Yachay EP shaped the trajectory of Yachay as a whole. By studying Yachay's infrastructuring across time I was able to apply the BOAP approach, which is often more associated to the study of the development of artefacts, and offer an application of the method to a techno-scientific project in a region of the world mostly overlooked as a source for empirical or analytical insights in STS. This contributes to the method by offering a way to study political and techno scientific developments in tandem focusing on the life of a government led innovation project.

Furthermore, in Chapter 4, I studied a process of infrastructural repair as an interstice to study the dynamics of expectations in tandem with infrastructuring practices. I was able to do so because in a process of repair, the actors involved are often explicitly considering the past of an infrastructure, and how it functioned, in contrast to its expected future. Would they want to repair it in a way that just resumes its functioning in connection to the broader technological setting? Or, would they want to tweak something during the repair process so it can have new functionality, perhaps separated from its previous technological setting? In the case of Yachay the actors from the government, namely Yachay and SENESCYT actors, had a specific way of understanding repair and what the process would imply materially and symbolically for the past and future of the space. It was not only a reconstitution of the material properties of the Hacienda buildings which was a stake, but also a materialisation in the infrastructures of the expectations mobilised by the government, i.e. the change in the productive matrix. This implied a recognition of the historical debt illustrated in the transition from a privately oriented manual labour fed Hacienda towards a public university oriented to science and innovation. In connection to this moment in the life of Yachay as an infrastructure, I also studied how the temporalities to which the infrastructures are connected at different points in its history shape practices that generate decay. For example in Yachay, based on their own anticipation of what could happen if they did otherwise, the government decided to expropriate simultaneously the 4600 hectares that would comprise Yachay if developed according to the Master Plan. The effects were not anticipated. For one, they faced the resistance from a variety of landowners with different interests and motivations that would end up constituting a constant tension for the project in the following year. Additionally, a vast amount of the expropriated land began to decay as the project would use it only incrementally as it developed. This land, which was, in a way, promised to the future, was abandoned in the present to the forces of decay and erosion. Through this ambivalent dynamic, the thesis showed the multiple temporalities coming together in a moment of the life of an

infrastructure, defending the argument that studying timescapes is essential when investigating infrastructural developments. This evidence allowed me to understand and highlight the historical dimension of infrastructuring processes, how they intersect with longer duration dynamics and how they become entangled into the future with these longer duration trajectories. The case of the distribution of land in the region of Urcuquí and how Yachay's implementation both influenced it and was influenced by it illustrates this point. These findings may help us to understand how important the local settings and their history when studying infrastructuring processes are. For instance, the evidence presented here suggests that focusing on the novelty of the elements being constructed may be detrimental if one overlooks the stories materialized and lived in that place, this may prove especially true in settings strongly shaped by colonial histories, to which STS has offered little attention until a few years ago.

In the same vein, during Chapter 5 of the thesis I described the internal operations of Yachay EP in practice beginning with the appointment of the first general manager of the public enterprise and into the processes of evaluation of the expectations at play. An element that emerged from these observations was the central role that already existing relations that predated the project had in how Yachay EP was constituted and in its operations. Taking this evidence in mind, I highlighted the temporal layering of relations through the concept of *relational infrastructures*. The concept was used to capture the relations I observed during my time in Quito and Urcuquí, often tied together by power relations, which were part of Yachay's dynamics and connected it to the associated scenarios, which exceeded the project's lifespan. For example, in Chapter 5 I described how during the early consolidations of the administrative operation of Yachay EP the selection of its general manager was tied to previously acquired and sustained alliances and coalitions, and these connections shaped the modes of evaluation and future projection of the project in practice. This finding, while preliminary, suggests that the concept of relational infrastructures helps to grasp how actors are not only investing and committing to personal or institutional

concerns, but also to specific sets of relations that are often let out of sight when actor's trajectories are not studied across time. It captures how some relations become foundational with respect to new relations and emergent dynamics and in this sense enable the observer to grasp beyond an existing infrastructure or project.

Considering this, I can argue that while Yachay was part of the public system in Ecuador, and although it was a special part that had autonomy, it nonetheless was shaped by sets of relations that already existed beyond Yachay and the other way around. An example of this is the connection between ex-president Correa, René Ramírez and Héctor Rodríguez, in the light of the internal struggles between factions in the government. Moreover, the relation between the CalTech members of the Board of Trustees of YachayTech is also an example of a previous relationship that travelled to YachayTech and sustained the organization of the University in several levels. For these reasons, the exploration of this project cannot leave aside the analysis of internal relational infrastructures in the public sector. In the case of Yachay, the political line that its leaders pursued made it almost an obligation to maintain their political positions within their political party while sustaining their decisions as leaders of the project. I have referred to these networks as part of the relational infrastructures to which the project is linked, and that were shaped during the project as well. For example, by constituting relationships more or less stable, more or less visible, upon which decision processes were supported, distribution of responsibilities was made, and the selection of new employees was addressed. Furthermore, this ultimately shaped the information flows towards the rest of the people and institutions involved in the implementation of Yachay.

This combination of findings provides support for the conceptual premise that the notion of relational infrastructures captures a key component of the dynamics of technoscientific projects not yet explored in depth in STS, especially in non-traditional settings like Ecuador. As a concept *relational infrastructures* already implies a hierarchical ordering of relations that complements flat representations of socio-

technical assemblages that mostly focus on a given present and on the novelty of the relationships established there. Based on my research I can argue that in all infrastructures, their stability and operation is sustained over constant enactment and actualization, and cannot be taken for granted. Precisely for these reasons, the actors in a sociotechnical project are invested, committed and sustaining multiple interests, motivations and durations. One of these elements is the relational infrastructures to which the actors have committed in the past, which, in a setting with high volatility such as Ecuador, may continue or not throughout the rise and fall of particular projects or even institutions. In short, based on my evidence I can argue that when looking into the future, a form of anticipation and long term planning is also investing in stable relations that could serve as the foundation for future participation in other arenas and dealing with the unexpected, which tends to be recurrent. Thus, the concept enables to connect multiple temporalities and dimensions (practical, political, financial) in the study of an infrastructure while focusing on its infrastructuring across time.

In this line, Steven Shapin has highlighted the importance of trust, familiarity and personal connections in the high-tech venture capital entrepreneurship world (Shapin, 2008)¹²³. The concept of relational infrastructures explicitly recognises the importance of these dynamics while also connecting them to their role in the infrastructuring processes of Yachay. On this train of thought, one characteristic that makes the notion different to that of networks for example is precisely the implicit layering of relations, through which one-relation serves as foundation or infrastructure for other relations, often becoming invisible or taken for granted. The BOAP approach became a valuable tool when studying these relations because longitudinal observation helps to make them evident, observe how they travel between settings, and are sustained across an actor's trajectory as he moves between institutions or maintaining their own standing within a party or a

¹²³ While my study has focused on a public led project the notion of relational infrastructures could also be aptly applied to private oriented ventures, Steven Shapin's study demonstrates that these connections are fundamental in private led settings too.

government across time. One of the issues that emerges from these findings is precisely that the relational infrastructures that become assembled into a new sociotechnical project can only, or almost only, be observed and studied if that project is observed across time and the past trajectory of the actors that come into the project is a matter of interest for the researchers. This thesis shows that the methodological approach suggested by BOAP theorists can also aid in generating observations across time that can give rise to concepts that aim to capture longer-term relations and links such as the ones I encountered in Yachay. I consider this a valuable insight for STS based on my empirical evidence.

Further research and theorization need to be done to fully incorporate the insights from the literature on expectations with the productive scholarship on infrastructures. Both are marked by their temporal approaches and could benefit from their interaction, as it has been explored here. In order to intertwine both bodies of literature robustly, scholars could implement a temporal dimension in their studies: infrastructures interact with expectations throughout time, so focusing on infrastructuring dynamics rather than on the stable aspects of infrastructures may prove useful. Moreover, they can find in other systematic approaches to temporal phenomena such as temporal studies (Bastian, 2009, 2013; Birth, 2012b; Huebener, 2015a, 2018; Pschetz et al., 2016; Sharma, 2013, 2014) fruitful discussions and debates to enrich their analyses. This is of particular interest in settings like Ecuador that are marked by profound historical inequalities, and where it is not sensible, neither academically sound, to ignore histories and local temporalities by focusing on novelty and futurity only.

7.2.3 Contexting

Moving on, by focusing on my empirical work I want to talk about how this thesis contributes to the understanding and study of contexts in STS. By using a metaphor, I would like to discuss how the approach to expectations highlighted across the thesis intersects with my reflections around contexts and *contexting* (Kristin Asdal & Moser, 2012) in a complementary way, focusing on how the notion of *contexting* has been

applied and extended drawing on my fieldwork. The metaphor is as follows. Having studied expectations in practice as presented especially in Chapter 3 and Chapter 4, I can now argue that expectations bring to the analysis two, somewhat orthogonal dimensions. The first I describe as *vertical extension*. Based on my evidence I propose that a *vertical extension* of the enquiry concerns time. To be precise, I refer to actors' active and manifold relation to pasts and futures, which in this metaphor constitute "up" and "down" (without implying any particular hierarchy). The notion of *Contexting*, on the other hand, considers a *horizontal extension*. A horizontal extension would be one concerning actors' active relation with those elements of their presents that go beyond or are not immediate, to the actors' own scope, but that are, nonetheless, relevant and meaningful for their agency. Therefore, actors have a complementarily profound relation with the present; this is so because actors have a relationship with the present that looks deeper when we take the spatial horizon of their actions, their contexting strategies, into account. This spatial dimension complements the temporal dimension that I have just discussed and derives from the problematization of the notions of time and context that this thesis has enabled. In the following paragraphs, I explain this idea in more detail drawing on my fieldwork and on how it extended my initial theoretical and methodological approach developed in Chapters 1 and 2.

As I see it, the sociology of expectations (Brown et al., 2003; van Lente, 1993c, 2012) brought to the table not only the theoretical resources to analyse and empirically trace collective future orientations and how these shape the making of sociotechnical fields in the present. But, precisely by doing so, this scholarship also contributed to underlining the importance of taking into account empirically the temporal complexity of actors and collectives. This means that sociotechnical dynamics and the actors engaged in specific projects or events draw on futures in multiple ways, which speaks about a multifarious relation with durations and timescales, way beyond a simple adjustment to the present situation. This problematizes the traditional understanding of the past as the main driver of social action, and futures as mere representations or imagined states that would be of greater interest for science

fiction than for social sciences (Poli, 2014). It does so, by bringing to the fore the temporal complexity of current sociotechnical dynamics.

I have tried to complement this approach and offer a contribution to the study of sociotechnical dynamics in STS more generally by acknowledging the past components of expectations. Thus, signalling the importance of including the temporal extension of temporal horizons of actors and how they sustain effective relationships with both futures and pasts. Here, the temporal horizon of my object of study (Yachay) expands and enables me to grasp how at any given present actors' behaviours are both oriented to the future (forward) and to the past (backwards). As argued across all chapters, I see both temporal relationships as challenging. Both are constituted by ongoing situated and partial understandings of both pasts and futures, and neither can be taken for granted: both futures and pasts are at stake and at play.

I applied the concept of *contexting* (Kristin Asdal & Moser, 2012) when working on Chapters 3 and 6 in order to make sense of the data I was gathering about how contexts were being constructed and positioned within the political dynamics corresponding to those moments. More precisely, I encountered how Correa mobilized very specific readings of the nation's pasts and futures, and of the priorities nationally and regarding Ecuador's relation to the rest of the world, in order to justify, create and implement a great series of political, socioeconomic and normative changes. Similarly, in Chapter 6, I encountered how Lenin Moreno, the newly elected president, in 2017 started contesting and reinterpreting the contexts that Correa had delineated in the recent past, and through that reinterpretation positioning and defining a different context.

The way I apply the notion of *contexting* aims to complement the temporal extension - that I call vertical extension - with a different yet complementary extension: horizontal or spatial extension. In my case, this aims to highlight the ongoing intention of actors to envisage not only the future and the past but also the present conditions that go beyond what for them constitutes their own scope of action, i.e. their present. In other words, *contexting* puts the onus of the analysis in the active

engagement of actors with the complexity of the present and the attempt to reduce the complexity of that present by weaving together specific observations and understandings. Moreover, these I have realized now, shape more or less stable referents for action, which are often represented as being outside of the phenomenon at play. One clear example of this horizontal extension is how the electoral climate influenced the decisions being made in Yachay in 2017, which I discussed in length in Chapter 6. This active engagement with the multiplicity of the present beyond the actors' own scope, contributes to a richer understanding of how actors orient their actions by generating contexts that are significant both for individual and collective (for instance, political) purposes. By studying Yachay through time, I encountered contexts not as stable and neutral entities but as elements that were changing too and being defined in different ways in connection to the actors coming into the scene and their own specific trajectories and interests.

While at first I intended to study the history of how Yachay had developed across time and how it related to Ecuador's history, during fieldwork I became interested in how actors on the ground, in real time and in practice, developed and used their own understanding of Ecuador's history and Yachay's dynamics. In Chapter 3, I described how Correa interpreted the history of Ecuador in a way that made the upscaling of Yachay into a City of Knowledge plausible. In Chapter 6, I described the opposite process of Moreno mobilising the context of crisis to downscale the project. Both Correa and Moreno, and the networks of people who worked for them, are subjects making history and creating contexts for action. As my fieldwork progressed I realized that the "history" I wanted to study at the beginning of my intellectual journey is not an external entity, but something made and remade by my subjects of study as they move across time and space. For these reasons, the way I have applied the notion of *contexting* in connection with expectations is a contribution to an STS/oriented approach for the study of sociotechnical dynamics in practice and connected to political and socioeconomic settings unravelling in tandem.

In the same way, my use of the notion of *contexting* aims to contribute to the BOAP approach as a methodology by aiding in the analysis of contexts not as external

entities to the phenomena being analysed but as co-constituents of the phenomena at stake. As explained by Hyysalo,

BOAP thus seeks to inquire into the links between relevant constituents to see their influences and interrelations (or lack of). Studying different contextual constituents means employing an array of often differing, conceptual tools, analysis types and methods to diverse materials (Hyysalo, 2010: 43). BOAP's preference for ethnographic study thus does not mean an in-built 'micro socio- logical' focus, but an examination of how the structuring elements are present in real-life situations, and in turn, how the situations re- shape the structuring elements and what can be learned about the patterns and structures as they are enacted. (Hyysalo et al., 2018, p. 7)

My contribution is to provide a language that can capture how different settings with dissimilar durations develop in tandem, and how actors make sense of this and act upon it within a specific project. I try to move Hyssalo's point forward by analysing how different actors with different positionalities observe very different scenarios of interaction. Depending on the specific position, actors observe some specific factors as open to negotiation, while they observe some others as parts of the situation they have to deal with but cannot influence much (Fincham, et al. 1995). I point out that these partial perspectives can be stabilized and mobilized beyond the actor's grasp into other groups and relational infrastructures. For example, in Chapter 3, I discuss how Correa's own understandings of the condition and history of the Ecuadorean Higher Education System, based on his own experiences, ended up being stabilized in the diagnosis of a required integral transformation. His vision, widely shared within his party, was tied to a broader understanding of Ecuador's political and social settings; moreover, it was institutionalized in the National Constitution, and the associated Higher Education Reform rolled out after the constitution was approved.

In short, these partial observations are turned into resources themselves and mobilized in the form of contexts, a practice to which I refer as *contexting* to make sense and act upon settings that are in principle too complex to be grasped fully. This is because the complexity of the world, including how actors are not transparent to themselves, at any point in time exceed the ability of actors to grasp it totally. The world cannot be perceived from an overarching “objective perspective” as that would imply either a) a god-trick (Haraway, 1988) and thus a relinquishing of the notions of situated and partial perspectives; or b) the paradoxical description of contingent actors as being able to observe the world while also observing their own observations of the world and their own blind spots (Luhmann, 2000; H. Maturana & Varela, 1987).

In this sense, the notion of *contexting* aims to grasp the actions of weaving together observed or experienced elements. These elements are not causally or necessarily connected temporally or spatially, and come from partial and situated observations into the shape of contexts that can work as more or less stable points of reference for daily practices for a wide variety of actors. I have tried to exemplify these contexts by highlighting the role of expectations in their making. Expectations connected to understandings of the past and the future while generating incentives and opportunities for action in the present. These pasts and futures are also situated and partial observations, which can be mobilized from individual accounts such as Correa’s, into collective referents such as Yachay as a project and different lines of public policies. These mobilizations are facilitated by relational infrastructures developed over time that connect actors beyond specific settings. By doing so, through the notion of *contexting* we can study how expectations influence contexts and how they are mobilized across settings through relational infrastructures. I consider that this is a contribution to both the BOAP approach and its implementation in practical settings dissimilar to Europe and North America, and also to STS as it provides a way to study temporal phenomena empirically within a specific site or project without losing sight of the wider dynamics at play.

This is connected to a richer understanding of how the past is active in sociotechnical practices emerging from my study of Yachay. One of the temptations in which we can

fall is to reduce the context to a stabilised and frozen vision of the past: reduce the explanatory forces to circumstances located in the past, and outside of the phenomena themselves. The problem is that we generate a frozen view of both the past and the contexts. If we take them only as anonymous entities, we cannot see how they are operative and are in constant readjustment in the individual actors, nor how more recurrent and systematic ways of including them in the more complex institutions and social systems are constructed. As I developed my empirical research, I realized that in practice the past is multiple and under construction, precisely because what we call the past is not necessarily a reference to an ultimate truth but a way of representing or enacting in a particular way elements that have happened, with the changing tools of the present. For example, this was evident in the way different actors described Yachay's origin in different ways, tying it to their own personal careers or to the changing status of the project within the government. Similarly, Correa's party own interpretation of Ecuador's history was of course partial and connected to their own agenda in the present, nonetheless it became materialized in a number of legislations and innumerable public policies including the reforms of the education system. Many of the conflicts between the government and oppositional forces were precisely around their own interpretations of the pasts at stake including what was the country like before Correa's government. In this sense, I realized that actors are not historians but they do make history, and that one of the issues that emerge from these findings is that the way of understanding contexts must go hand in hand with a problematization of the notion of the past as something totally stable and objective.

Similarly, this finding has important implications for problematizing how individual narratives tend to be contexted even within the social sciences without taking into account the uneven temporal and power-related structures homogenised under a common context. Consider the use of the notion of crisis across the social sciences, a concept that when not problematized may obscure which actors are actually experiencing the moment as a breaking point and why, and which actors have the luxury of *contexting* crisis but not experiencing the setting as critical. In my case

study, I have highlighted how Lenin Moreno government's specific *contexting* of crisis put enormous pressure over the shoulders of low-tier public employees (thousands of which were fired), public institutions among which was Yachay, as well as the middle and lower classes through austerity measures. All of this while condoning long-standing debt to large private conglomerates, configuring relational infrastructures between the state and powerful socioeconomic groups, and re-establishing dealings with the IMF (International Monetary Fund). These processes have included the dismembering of several Ministries, a marked reduction in public investment that in turn contracted the medium- and long-term planning for public policies, and the dismissal of teachers, doctors and a significant number of public officials from all over the state, among other effects. In short, by *contexting* crisis in a specific way, Moreno's government, along with the relational infrastructures connected to him, broke with the notion of an extended present that the previous government had tried to position, and generated its own futures. Furthermore, they generated and actioned their own contexts and by using the central role of the government in the country, reshaped the present and constructed different futures for Yachay and Ecuador more generally. Futures apparently pre-justified by the *contexting* of crisis afore.

The present study raises the possibility to problematize empirically the weaving together of elements into an established context, such as a crisis, to examine the delimitations enacted between text and context in the given situation. I can draw from my fieldwork that some vital questions one should ask in a given setting are: what is past, what is present, what lies outside of the phenomena, what lies within, how agency is distributed, the expectations that emerge from that context as well as feed it, and to explore the uneven temporal experiences of multiple actors who are expected to adapt to the temporalities of that *contexting* practice. In practice, Correa and Moreno answered these questions very differently, as can be noted in Chapters 3 and 6 of the thesis. In order to analyse the corresponding the contexting practices I asked these questions when reading official documentation from Moreno's government with respect to Yachay, its trajectory and how it was being evaluated.

These questions became relevant when understanding how Moreno positioned his own government and justified the measures he would take concerning Yachay. Similarly, one central component of my interview with Rafael Correa was trying to understand how he positioned himself and his government along Ecuador's history, how he defined the situation he encountered when starting his period and what elements of the immensely complex history of the country he considered more relevant for the actions he would eventually take in his government. In short how he stabilized a context, temporally and spatially for his government.

I think these reflections about the nature of contexts are particularly important in a time when the notion of a global crisis is widespread and often tied to "the sense of undoing that many call the Anthropocene" (Hetherington, 2019, p. 2), a concept that has become central to many social sciences including STS (Haraway et al., 2016; Hetherington & Et.al, 2019; Latour, 2013). While crisis has been studied and questioned in other disciplines (Cordero, Mascareno, & Chernilo, 2016; Esposito, 2017b; Knight & Stewart, 2016; Masco, 2017; Roitman, 2013), in STS the theme remains understudied, especially in settings beyond North America and Northern Europe. This is why the notion of *contexting* may prove useful for STS analysis of how contexts are constructed and become operational in settings beyond the hegemonic ones.

Drawing on my approach, but going beyond the analysis of Yachay one example I want to point out is how the *contexting* of crisis became an attempt to abolish multi-temporality. Huebener describes multi-temporality as "a concept that accounts more broadly for the coexistence of many temporal modes and experiences within a social collective." (Huebener, 2015a, p. 22). I argue that the *contexting* of crisis in Moreno's government attempts to negate multi-temporality because the positioning of crisis was presented as intending to break with "normality", with the *contexting* of an extended present of Ecuador as a country progressing and breaking with its past that the previous government mobilized. However, as other authors have pointed out, crisis instead tends to generate that precise sense of "normality" by offering the emergency-marked 'abnormal' as a contrast. The government presented these two

generalized visions as the only two valid experiences of temporality possible, disregarding all others. This sense of normality can be represented positively or negatively, often in drastic terms as in this setting, and feeds into representing the problem as a clash between factions. The problem is that this dichotomy normality/crisis tends to overlook and smother multi-temporality at both ends through the way it represents the world by collapsing uneven and multiple experiences-temporalities into a general narrative of crisis/normality.

Moreover, besides being potentially used to mobilize damaging measures for whole collectives, as in Ecuador, this may also imply a flattening of social differences and obscuring the diverse uneven roles of actors in actually maintaining, repairing and caring for that precise world in “crisis” (Denis & Pontille, 2015; Edgerton, 1999; Graham & Thrift, 2007; Murphy, 2015). As presented in this thesis, this in itself can deteriorate the situation and reinforce structural inequalities, as well as mobilize the foundational-oriented narrative of having to restart from scratch, collapsing long-term processes and imposing austerity while invalidating the potential of repair and reconfiguration. In a sense, crisis also damages our capacity to think and imagine multiple futures based on the multi-temporality of the present. As in Moreno’s government, under this light measures are often portrayed as necessary, surrounded by an apocalyptic aura of non-contingency, and thus seemingly transferring accountability to an external force, be it a shocking homogenised past or a generalized imposition from the circumstances of the present. This portrayal limits the acknowledgement of the already present abilities to respond to the complex situation in manifold ways¹²⁴.

¹²⁴ See for example Donna Haraway’s take on this matter: “What is it to surrender the capacity to think? These times called the Anthropocene are times of multispecies, including human, urgency: of great mass death and extinction; of onrushing disasters, whose unpredictable specificities are foolishly taken as unknowability itself; of refusing to know and to cultivate the capacity of response-ability; of refusing to be present in and to onrushing catastrophe in time; of unprecedented looking away. [...] How can we think in times of urgencies without the self-indulgent and self-fulfilling myths of apocalypse, when every fiber of our being is interlaced, even complicit in the webs of processes that must somehow be engaged and repatterned?” (Haraway, 2016, p. 35).

In short, the notion of *contexting* could be an avenue through which to study the mobilisation of a crisis narrative and other situated practices of *contexting* taking into account power dynamics, temporal extension and using the tools STS has developed across decades while connecting with other fields at the same time. As I mentioned, for the reasons sketched above I consider the concept a valuable contribution to the BOAP approach and to an STS-inspired analysis of sociotechnical projects beyond Yachay.

7.2.4 Observing Yachay across time and what this has allowed me to analyse of Ecuador's dynamics

While my analysis has been focused on Yachay, throughout the thesis, I have analysed the project in tandem with some of the political and economic trajectories of Ecuador that were unravelling at the same time with dissimilar durations. I have focused on some of the temporal aspects that characterized the Correa administration and the multiple elements constituting Yachay's timescapes. In this section, I reflect on some of these themes thinking about Ecuador with respect to its pasts and futures, and about the possible position of Ecuador and Latin America in STS research.

There is no doubt that Yachay became a focus of the tension, possibly due to the personalization of the project in Correa's figure. For example, portrayed as his legacy after 10 years in government, and in the metonymic representation of the whole of Correa's government in what Yachay meant for Ecuador. The same expectations that scaled the project up regarding the dramatic impact it was supposed to have on the whole economy and education system¹²⁵, and the amount, and ambition, of the investment required, made it possible for the media to use those same expectations as a measuring tool against which the "realities" of the project could be compared. The expectations that allowed the project to gain political, legal, economic support and strength were re-constructed by some media as standards to judge it and treat it as emblematic in respect to the government both in its possible achievements and

¹²⁵ <https://www.presidencia.gob.ec/rafael-correa-yachay-cambiara-la-historia-de-la-universidad-ecuatoriana/> (last accessed 17-05-2020)

as a symbol of mismanagement and waste of resources¹²⁶. In short, a failure representing Correa's government. This shows the boomerang effect of expectations as they can come back haunting their proponents, and become a burden not only for the imagined futures themselves but correspondingly for the potential reconfigurations in the contingent present of those expectations.

The same was true in the case of the government, as noted in previous chapters because from quite early in the life of the project Yachay was presented into public sight as "a fulfilled promise of the Revolución Ciudadana" (C. Yachay, 2014) and as the greatest venture and success of Correa's government. One of my interviewees even told me that during a meeting with high authorities, Correa had mentioned that if Yachay were to be successful, then everything else the government had worked for during those 10 years would have been worth it. Yachay was both being shaped by and shaping a number of spheres, groups of actors and social dynamics beyond its own setting.

For example, the compressed foresight through which I analysed Yachay in Chapter 5 was not occasioned by the central government or by the EP, or by any of the actors in particular, but by the ecology of actors that met in Yachay as a whole and the timescapes that were shaped within. Including groups such as the mass media and Yachay's critics from the university system, who in their own ways shaped the temporalities of the project, were part of the evaluation of the performance of Yachay's expectations, and more widely shaped the background in which Yachay was embedded. The compressed foresight in this sense had to do not only with the linked ecologies (Abbott, 2005) coming together in the project but also with the

¹²⁶ To see a study on the different ways Yachay has been portrayed in the media, comparing the framing of *El Comercio* (a traditional newspaper based in Quito, with a highly oppositional and critical framing of the project from the beginning) and *Diario El Norte* (based in Imbabura, the province where Yachay is being constructed, with a more balanced perspective highlighting both conflict and problems, as well as support and advance) see, Celso da Silva (2008). This "selectivity" has also had academic resonance, for instance compare Da Silva's analysis and the critical reading of Chavez & Gaybor (2008) with the frankly baffling and false affirmation of G3nzales et. al: "Indeed, as has been already said, it is extremely difficult to find articles in the press questioning the Yachay project. We verify, for example, that although critical notes about the project had been published, they had been removed from the websites and we could only locate them in the newspaper archives of the respective newspapers." (translation from Spanish is mine) (Fern3ndez Gonz3lez et al., 2018, p. 352).

interconnected actors, some of which were part of the project and others who were not, whose relationships developed across time beyond Yachay. Here I mean beyond both in the sense that they probably preceded the project as well as in the sense that their trajectories are connected in settings beyond the project. Such as the tension between Correa's government and the mass media beyond Yachay, and also the resistance of a significant part of the University System to the whole of the Higher Education Reform and not only to Yachay.

In this sense, when conducting research it is not enough to capture the diversity of actors who coincide in a specific moment in a project, in a snapshot fashion, or in its broader dynamics. In addition, it is also crucial to capture the development of other relations, some with long-duration, some emergent through time in the midst of other settings of struggle, negotiation and connection. This element has been highlighted by the scholars of the BOAP approach through the idea that the evolution of practices and technologies is better understood when studied as happening in the midst of multiple ecologies coming together:

...the shaping of technology and practices must be viewed as taking place within *ecologies of interconnected actors*, and not only study the actors only with respect to how they affect the studied technology (e.g. see Bijker's [1995] "relevant social groups") as this leaves aside the rationales by which they operate. It also misses the often complex and subtle mechanisms by which actors within an ecology interrelate (Hyysalo et al., 2018, p. 6)

In this thesis, I have tried to complement this approach by highlighting the importance of relational infrastructures as a channel through which interests and motivations travel from one setting to another. For example, from a political party or a friendship into the setting of Yachay or a work-environment. Moreover, I have argued that relational infrastructures constitute one of the elements to which actors are committed when looking into the future and making decisions with respect to

matters that cannot be calculated in advance. In other words, actors, when oriented to the future, do not only commit to their own expectations, nor only to institutional or organizational expectations such as Yachay, but they also commit to the maintenance, strengthening and expansion over time of relations beyond formal settings. Relations that are rhizomatic: they have many, multiple ramifications both formal and informal.

In fact, in a context in which institutions and organizations tend to be unstable and precarious such as Ecuador, committing to the long duration of certain relations seems to be less risky for actors, as these relations can survive and flow through organizations and institutions. The same is the case of committing to many relations, both short and long term at the same time; if one fails, or a setting collapses, then one of the others will survive without being utterly reliant to that setting. In fact, conducting my study in Ecuador is what enabled me to reach these conclusions as the setting facilitated the observation of these phenomena.

For example, one of the temporal elements that connected Yachay with the Ecuadorian government during the Correa administration was the tension between the immediate and the long-term. As highlighted especially in Chapters 3 and 5, the long-term expectations of Yachay also demanded specific more immediate elements such as visible results that could maintain the political capital of the government as well as protect the project from the media scrutiny, and extend the present of both the government and Yachay. As I tried to argue, this tension between different temporalities, sets of actors and institutions was present all across the Correa administration. Furthermore, it was part of the long duration dynamics of Ecuador's political sphere, which both shaped and were shaped by Correa's 10-year administration. The interconnection of these different elements generated a timescape in which Yachay had lots of problems evolving. To name a few: 1) the marked instability of and public policies; 2) the dependency on international oil prices associated to the dominant role of the state in the national economy; 3) the political rhythms dictated by the timing of elections; 4) the insatiable requirement of results that could sustain the process across time; 5) the unexpected events on the base of

which priorities were readjusted, and 6) the sudden shift in government's policies even when people voted to the same party.

Furthermore, if this tendency to short-termism, and shrunken temporal horizons, is recurrent in Ecuadorian politics, i.e., if it is reiterative and can be mapped across decades (Cueva, 1972; Henderson, 1997; Pachano, 2004,) why should we call it short-termism? What if the short-termism is only so with respect to public administration and the specific visible public policies of governments, but not to the long-term maintenance of personal ties, of relational circuits, and of the relational dominance of groups or even individuals? In which futures are actors investing simultaneously, and how are these temporalities modulated by the socioeconomic dynamics of Ecuador? In a way, the notion of relational infrastructures aims to ask these questions on the base of what emerged from my investigation in Yachay.

I was interested in these questions but referred explicitly to Yachay and to what could be observed from paying close attention to its development across time and taking temporalities seriously. Here again, we find that adopting only one temporal lens, let's say contracted temporal horizons in politics, as a descriptive tool is not sufficient to characterize the complexity of temporalities in such social phenomena. The multiple tendencies and temporalities being mobilized do not fit a simplistic model of slow/fast, acceleration/stagnation, short-term/long-term. As has been critically noted by scholars in the field of temporal studies, research on temporal politics needs to move beyond or dig deeper into overly-simplistic temporal representations, and explore the multiple modes of time that coexist within a collective (Bastian, 2019; Huebener, 2015b, 2018).

In this sense, on the one hand, the problems revealed in Yachay EP and YachayTech are a symbol of a problematic administration. However, on the other hand, these problems also denote components of complexity, controversy, conflict, clash of visions, roughness and disruption. And, importantly, these constitute a fundamental part of scientific practice, of the dynamics of innovation and of the generation of socio-technical projects. From everything that has been deemed as being well or

poorly done in Yachay, we should not derive a sanitised and purist vision of sociotechnical practice, which in the long run would affect not only the entire university and research system of Ecuador but also a one-dimensional framing of the relationship between science, technology and society. This sanitised vision does not match, nor seeks to understand, the particularities of scientific practice and technological generation. These dynamics are not linear nor devoid of mistakes and conflicts, as the literature in STS has argued for decades (Harding, 2009; Jasanoff, 2004; Law et al., 1987; Pinch & Bijker, 1984).

Instead, from the complexities of Yachay, we could develop a more nuanced account of the structures and dynamics shaping the institutionalization of these type of initiatives. That is, an account of the linkages that are in motion, and the challenges and tensions that they have to face. With the State having a crucial role to play in the shaping of public policy regarding science, technology and innovation, it is crucial moving forward to generate greater transparency in terms of risks for the actors directly and indirectly involved (such as the communities in the perimeter of Yachay) and with respect to the elements of uncertainty that cannot be eliminated. Moreover, it is also desirable to cultivate and promote a space for experimentation within policymaking, avoiding to fall into discourses and practices of *compressed acceleration* in the pursuit of immediate or long-term results. One aspect that makes Ecuador and Latin America significant in this respect for STS is the specific ways in which governmental administrations configure temporal rhythms and political processes in the region. The case of Ecuador is particularly interesting in this respect. As I have discussed throughout the thesis, the pressure to comply with immediate results sustains, in the long run, the country's political instability. In cases such as the Ecuadorian where the state and its officials are rapidly and continuously changing, sociotechnical practices should consider the time that public organisations take to generate institutional memory and institutional learning. This is very important, especially if the goal is to train public servants who have the experience and knowledge to undertake projects of high socio-technical ambition. That is, professionals with greater efficiency and administration capacity, sensitivity for the

local setups within which the projects are interwoven. As well as for the strategic timing required for successful interventions of the state in the regulation of educational institutions, companies and others. (Park, 2014; Yoon, Kim, Buisson, & Phillips, 2017)

Furthermore, these issues connect us with a fundamental problem of legitimate representativeness: democratic metonymy. Why what happened in Yachay was represented either as "the transformation of Ecuadorian society triggered by the *citizen revolution*", or, "the failure of the political project of Rafael Correa and his entire government"? This is not a purely ideological problem, as some studies of Yachay have pointed out (Chavez & Gaybor, 2018; Fernández González et al., 2018). Let us change for a moment our focus of the missteps that happened in Yachay precisely as problems generated by the continuous interaction within a project of compressed temporalities, the political urgency tending towards reducing latency, and the pressure from the media due to the embodiment or personalisation of the project in the president, among others. From there, we can point out not only to the people who are part of the project but also to a form of administration that needs to be recalibrated, reconfigured, and repaired. In Ecuador, the geographical, ecological and human diversity, especially when the local particularities at the historical and sociological level are not taken into account, makes it challenging to construct and continue public policy. I have tried to capture that diversity and the local dimension, through a combined temporal and infrastructural approach in which taking into account historical trajectories and the entanglement of multiple infrastructures and temporalities is fundamental.

The current stage of Yachay can be seen as an opportunity to repair the project and avoid its fall into decay. This can only be achieved with the recognition that there are not only short-term political positions at stake but also durations and development of longer-term practices. Furthermore, this implies recognizing not only the complexity of getting involved in these types of projects but also of the current vulnerability of the multiple contexts at stake that are formed and mobilized in Ecuador. To name a few, the dependence on oil that generates economic instability,

the absence of sufficiently complex state organizations to handle such a project, the deficiency of historical relationships between public and private actors, the constant re-emergence of contexts of high political volatility, among others. These type of projects are disruptive, problematic, requiring readjustments, maintenance, repair and a general decay management. What the Ecuadorian case in its complexity shows is that a recognition of this vulnerability is fundamental to achieve more robust projects that can respond to social needs adequately and remain flexible to reconfigure expectations accordingly.

To achieve this, both the practices within Yachay and in the social ecosystem that surrounds it should change. Similarly, my focus on the Ecuadorian setting and its particularities shows that we need to reconfigure our understanding about, and our trust, in public innovation projects and that we need to accommodate that they may partially fail and need reconfigurations on the go at all levels. Yachay and its development across time can become an example for other projects in the region to highlight that skills that have been part for a long time, and recognized as fundamental, in the private sector's ventures such as "to be an entrepreneur is to fail... and to be able to learn from that" need to be acknowledged and accepted as a component of public and collective innovation projects. Yachay illustrates how allowing space for mistakes and alterations in the expectations surrounding projects is fundamental. In line with this, governments should understand the potentials and pitfalls of temporary compression linked to developing a sensitivity that is resilient to the practical difficulties of scientific research and the development of new technologies. On the contrary, the centralization of decision-making and the negation of vulnerability in settings across Latin America can become part of the continuous cycles of disrepair and decay that have historically shaped the region (Velho & Ureta, 2019). In addition, the ecuadorean case study also challenges the narrative of the private entrepreneur radically transforming the landscape into an innovation system because the agency of the entrepreneur is part of a broader ecosystem where multiple actors converge, and the entrepreneur's agency is sustained on multiple other relational infrastructures as my case has illustrated. Among which the role of

the state through funding in diverse areas, creating incentives and risk-taking is fundamental (Mazzucato, 2013; Mazzucato & Semieniuk, 2017). My case study also shows the difficulties of assuming the state is a monolithic entity and that public investment in settings such as Ecuador can be sustained ignoring historical inequalities and contextual shifts.

The following section describes how I think the reflections and concepts presented in this section of the conclusions contribute to STS generally and to other fields interested in similar topics.

7.3 How this analysis contributes to STS and other fields looking at similar issues

To summarize, I believe the theoretical and methodological tools presented in this analysis contribute to STS in several ways. First, by providing empirical evidence concerning why it is relevant to extend the current use of the concept of expectations to incorporate the role the past plays in them and in future-making practices more generally. In this respect, the thesis has provided evidence about how expectations mediate pasts and futures in practice, how they modulate specific ways of understanding and materializing both pasts and futures through images, through the transformation of individual understanding into collective resources and how they also modulate pasts and futures with respect to the construction of contexts and their mobilization. Concerning methodological issues, the longitudinal scope of the study has allowed me to map expectations changing across a project's life, along with the actors that come in and out of the project, while tracking how these resonate with the changes happening in other relevant spheres. While signalling to the importance of history and politics, the thesis has focused on how both appear within the scope of a given project, and how these can be studied through the life of the project itself. This is a contribution to the BOAP approach as it extends the current scope of the method to sociotechnical projects beyond artefacts, and constitutes one of the first applications of the method to the Latin American context. The thesis also complements the method by incorporating into the analysis temporal categories such

as contexting and relational infrastructures that could become a useful part of the current theoretical baggage of the BOAP approach practitioners.

Furthermore, if the sociology of expectations takes this understanding of expectations forward I believe this could pave the way for new connections with other fields such as the history of technology, critical temporal studies and the wider study of predictive processes in social and individual life. Studying expectations as modulations between pasts and futures makes the study of the pasts being mobilized and reinterpreted as vibrant as that of the futures being imagined. This could provide a bridge with historical methodologies and more generally with a more historically oriented sensitivity when doing fieldwork and theorizing. This bridge could aid in the long lasting tension between STS and more historically oriented fields (Kristin Asdal, 2012a; Daston, 2009; Dear & Jasanoff, 2010). While this thesis has not drawn explicitly on literature of the History of Technology, I have taken inspiration from the debates and ideas emerging from the field. Future research on Yachay and similar topics would benefit enormously from a closer collaboration and debate with the History of Technology and I hope to do so in my own future research. The intermittent zooming in and zooming out that the BOAP suggests as a valuable tool for longitudinal observation and that I have operationalized across the thesis, especially when zooming in into the history of specific places like the Old Hacienda in Urcuquí, could help trace a projects development in real time while not losing sight of its deep connections with trajectories with longer durations. A sociology of expectations concerned with how expectations modulate pasts and futures would engage in the task of analysing how through specific infrastructuring practices not only futures but also pasts are being enacted and disappearing, it would also be concerned with practices that go beyond innovation as novelty, like practices of repair, maintenance and reconfiguration. The discipline then would also be interested on the specific ways in which expectations are embedded into infrastructures, are visible through images and how they influence and become stabilized or destabilized through contexting practices.

Additionally, this extending of the concept of expectations to incorporate the importance of pasts could allow STS to be better prepared to engage in broader debates and collaborate with other fields currently concerned with temporal phenomena. This is the case of the field of Critical Temporal Studies (Adam, 1998; Bastian, 2014; Birth, 2012a; Huebener, 2018; Sharma, 2014) from which I have drawn throughout the thesis. The field provides a wider engagement with temporal issues from a social science framework positioning the study of the future within the study of more encompassing temporal dynamics such as chronopolitics, timescapes and the sociopolitical material organization of time. Taking the role of the past seriously is fundamental in this path, and studying both futures and pasts in tandem provides a bridge with a discipline concerned with a systematic study of temporalities not only focused on futurity. Similarly, this extension of the concept of expectations could allow STS to engage in debates around the roles of anticipation, prediction and expectations in social life that connect individual and collective weavings. These debates nowadays encompass subpersonal levels (non-conscious biological, chemical and psychological processes) as well as personal and collective processes (Clark, 2017; Constant et al., 2019; Karl J. Friston & Frith, 2015; Miller & Clark, 2018; Roesch, Nasuto, & Bishop, 2012). One key dimension is that predictions and expectations are studied precisely by analysing how they mobilize and activate embodied past experiences, in the form of proactive predictions, which shape individual and collective engagement with futures. In this sense, STS could engage in these debates, and contribute critically, from the strong position of decades of rich empirical analysis and nuanced theoretical tools to one of the central themes connecting multiple sciences in the present (Nadin, 2016; Poli, 2014). I believe that my thesis contributes in this respect by providing STS with a language and empirical material to develop these connections, drawing both on the tradition of the sociology of expectations and on wider social thought around temporalities.

Likewise, as argued through this chapter the conceptual tools I have used in the form of the concepts of *contexting* and *relational infrastructures* emerge from the methodological approach I have pursued and developed in this study. Both emerge

from the longitudinal observation of Yachay across its life, thus both are temporalized concepts that aim to grasp analytical tools that are useful when studying a sociotechnical phenomenon across its life, and not only in one precise moment in a snap shot fashion. My application of the concept of *contexting* contributes to the current critical analysis of contexts and setting as given elements that are nowadays being questioned and critically deconstructed within the discipline and beyond (Anderson, 2017; Brives, Le Marcis, & Sanabria, 2016; Kreimer, 2019). The concept became relevant when taking Yachay's infrastructuring as the focus of observation and analysis while asking about how dynamics taking place simultaneously in several other spheres and locations are partially stabilized and mobilized to influence Yachay and beyond. Contexting thus focuses on the practice of stabilizing and using contexts as resources to act upon given settings and influence them, I have provided empirical evidence using the concept to understand strong changes in orientation within Yachay and across the Ecuadorian state as a whole. This concept connected to my reflections around expectations and how they shape contexts contributes to STS with a language to study the stabilization of particular understandings of what a context is in a given moment. These framework aids in the analysis of how this influences and is influenced by expectations, and how big changes in perception about contexts happen across a project's life and in a state like the Ecuador historically marked by instability and political turmoil.

Relational infrastructures on its part complements the dynamics studied through expectations and the practices of contexting by focusing on how specific relations are stabilized across time and serve as basis for example for practices of contexting, and for mobilizing and evaluating expectations. Taken together, these concepts contribute to the study of sociotechnical assemblages in STS by providing tools to study sociotechnical phenomena in tandem with political dynamics through time and taking the past seriously, moving beyond the focus on the present conditions alone. In conjunction the analysis contributes to a wider and richer understanding of sociotechnical projects in Latin America that takes the politics of the region as a key component to take into account, of which there a few longitudinal studies with Eden

Medina's study of Cybersyn as one of the exceptions (Medina, 2014). Similarly, the study illustrates how a close empirical study in the setting of Latin America and Ecuador offer valuable sights for theorizing and generating insights for the discipline of STS more generally. This STS-framework provides an example of how economic, historical and political issues can be traced together by focusing on the life of a single sociotechnical project without losing sight of the wider complicated dynamics at stake.

Concerning contributions to other fields, as follows I will describe now how this STS-framed analysis offers insights and complementary analysis to other fields. I will focus on the fields concerning the study of Ecuadorian politics associated to Latin-American politics more generally, the study of smart cities and other areas studying infrastructures.

To begin with, even when it has not been the focus of this research, the thesis has dealt with several dimensions of the dynamics and temporal components of Ecuadorean politics. In this sense, I think the thesis has contributed to the field studying Ecuadorian politics two ideas that are by no means full-bodied in themselves but rather constitute from my perspective future lines of research regarding how Ecuador's past, present and futures interact generatively and destructively in the political realm. First, the thesis complements the traditional ideological-focused political analysis of Ecuador's political realm which has mostly centred on political economy and discourse analysis (Báez et al., 1995; Cerbino, Maluf, & Ramos, 2017; Cueva, 1997; Ibarra et al., 2008; Meléndez & Moncagatta, 2017; P. Ospina, 2011) by including a new dimension in the form of the analysis of the temporal politics at play. The thesis has studied this dimension both concerning Correa's 10-year government and how temporalities were observable and became relevant through the observation of Yachay across time. As well as concerning the longer historical dimension of the temporal politics shaping Correa's government. All of the chapters have dealt with this dimension, be it explicitly or implicitly. The multiple temporal politics of Correa's government have seldom been explored in the literature about that period in the history of the country, and, as I have tried to illustrate for the case

of Yachay, investigating this dimension may contribute to a integral and more in-depth understanding of the elements at stake. Furthermore, the thesis has contributed to in this line of research also by providing a detailed empirical account of how temporalities can be studied in practice, an STS-framework has allowed me to operationalize analysis that are often reduced to ideological struggles and discourse analysis. My temporal approach complements the current literature and positions STS as a valuable contributor to the analysis of Ecuadorian politics through sociotechnical and temporal issues.

Second, and related to the first point, by following the life of Yachay as an infrastructure and through its infrastructuring process, I have encountered multiple relational infrastructures operating within the Project and within the Ecuadorian government that do not fit with the image of the state as an unchanging homogeneous actor in innovation dynamics. In this sense, pointing to the central role of "the state" in general terms does not capture sufficiently the multiple actors and relational infrastructures entangled, often with conflicting interests and motivations, in one single government and within the state apparatus at any given point in time. Connected to this matter, I have also called attention on the temporalities of bureaucracy beyond technocratic approaches. That is, I have pointed out how many public workers of different status have to mediate and attune to multiple temporalities that many times are challenging to weave together, resulting in phenomena such as compressed foresight. In this sense, the thesis has contributed to the analysis of Ecuadorian politics by highlighting the importance of longitudinal observation and locating specific sociotechnical projects, like Yachay, as valuable and fertile observation arenas for analysing sociopolitical dynamics. Even the few studies that exist of Yachay have taken a snapshot approach to the investigation of the project and have mostly ignored the temporal dimensions at play (Chavez & Gaybor, 2018; Fernández González et al., 2018).

Building on these ideas, I would like to make a more general point about the relevance of Latin America for STS and innovation studies, and about how my thesis contributes in this regard. By looking at the temporal politics of progressive

governments in Latin America, such as the Correa administration and beyond, and at the vital role that the state undertakes in innovation processes in these countries, it may be possible to characterise public policy interventions under a new light. This is needed in STS as the discipline is now opening to take the region seriously as demonstrated by an increased attention on the region and on what it can offer to STS (Harding, 2016; Kreimer, 2007; Medina, Marques, Holmes, et al., 2014). Even more, this drift resonates with the postcolonial turn that is reshaping STS across the globe and calling into question many of the premises the discipline has taken for granted in the past decades (Anderson, 2017; Chen, 2017; Dumoulin, Kleiche-Dray, & Quet, 2017; Harding, 2016; Kreimer, 2019; Lin & Law, 2019). While the thesis has not dealt directly with postcolonial theory, it has taken Yachay and Ecuador as serious settings from where to extend certain aspects of STS's methodological and theoretical frameworks, as well as valid settings for theorizing based on empirical observation on this area of the world. The thesis has also dealt with how colonial legacies shape the material and temporal dynamics in a sociotechnical project such as Yachay. As well as the interrelation between central government and the communities entangled into infrastructuring processes in the midst of longer duration inequalities and power struggles.

In this sense, the thesis contributes with the general call to reintroduce a more nuanced political dimension into STS as the discipline runs the risk of "depoliticisation" (Thoreau & Delvenne, 2012), and of reducing governmental dynamics to technocracy. Interestingly, there is an associated call to develop intricate descriptions of the "contextual texture" of international innovation policies interlinked with the region, in order to track the "situated socio-political contexts and local realities" (Delvenne & Thoreau, 2017, p. 52) of Latin American nations and be able to inform improved policies for innovation and social transformation. Following this premises, this work has provided a longitudinal detailed study of how infrastructuring processes intersect in a number of ways with the specific politics of a Latin-American country, focusing more specifically on how and why studying the multiple temporal dimensions at play allows researchers to gain a more integral

understanding of the dynamics developing across time. This approach allows politics not to be separated from the material implementation of the project and reduced to an ideological component, but rather mapping how intricate the politics at play are as they develop in tandem with sociotechnical projects. A greater understanding of the temporal politics at play and how this connect with longer duration economic and relational components may allow for better interventions in specific contexts while not leaving aside the wider dynamics unravelling.

For example, if expectations are understood not only as referring to future techno-social arrangements, but also as directed towards the past, their study could contribute to a stronger tracking of how innovations systems, and technological systems more generally, connect to the specific historical trajectories of a given setting. As well as to the mapping of how specific actors understand and mobilize pasts to make sense and act upon the present and futures. In other words, the study of expectations may be a route to track the rootedness of innovation systems in particular settings and may be a path to explore the significance of histories in the making of futures. This is of particular importance if we take seriously Latin America as a fertile site for both empirical and theoretical development in STS as I have tried to do, as these are fundamental struggles in the region as I have shown with the problem of land distribution and the shaping of Yachay. To take Latin America seriously from an STS-perspective is also to be able to tackle long-term problems with generative theoretical tools, and to be able to study these problems while studying the scientific and technological dimensions in which STS is interested.

On the same line of thought, the concept of relational infrastructures may help capture and study attentively the stable sets of relationships that many times precede and survive infrastructural making and infrastructural breakdown in Latin America, a characteristic that seems to be a constant in the region (Velho & Ureta, 2019). The concept aims to contribute to the understanding of long-term commitments beyond institutions, particularly public institutions, to relationships from which actors both contribute and benefit from. In a setting of institutional volatility, relations may survive longer than infrastructural projects, or as in the case

of Ecuador, than presidents and political processes. Taking into account relational infrastructures in tandem with studying temporal dynamics may help to understand the rise in the region of political figures, and their approaches to innovation and technoscience, like Bolsonaro in Brazil or Jeanine Áñez in Bolivia. This may prove useful beyond Latin America if connected with the current call to problematize and open the black-boxes of contexts in the traditionally hegemonic settings where STS has developed (Kreimer, 2019a). My study of Yachay has taken me to a more detailed analysis of contexting practices and this is in itself a tool that destabilizes the common supposition of contexts as something that should be taken for granted or ignored all together in order to focus only in the present. One important connection between dissecting contexts and studying temporalities is the analysis of the temporalities of promises and how these are related to the specific settings in which promises are made. It is indeed different to make promises in Ecuador than in other locations, the terrain is different, the forces at play are dissimilar and this is also why histories matter for futures as my study shows.

Moving on, concerning other fields studying infrastructures, there is a growing interest in the present on the political and governance-related aspects of infrastructures beyond STS. In fact, there is a growing literature that extends the understanding of infrastructures traditionally related to physical networks, and takes into account the social arrangements required for their implementation, maintenance and operation. See for instance Thacker et.al's definition of infrastructures in their 2019 scoping study "Our definition of infrastructure includes physical assets in the five categories of infrastructure as well as the human and governance systems that are necessary to sustainably deliver services from those assets, including various versions of planning and organization." (Thacker et al., 2019, p. 330). This opens the door for studies such as mine to contribute to more macroscopic studies, which are very common in the literature outside STS (Straub, 2011), by providing focused and empirically rich accounts of infrastructuring processes in countries pressed for infrastructural investment like Ecuador. The current request to combine macro international studies with local and highly context/sensitive accounts

of infrastructural projects, their development and their governance posits my study in a good position to contribute with an STS perspective to the international debate. For instance, I have provided in the shape of the theoretical framework I used across the thesis a way to study political and governance-related elements of infrastructures into account without losing track of the specificities of the project itself. Among other elements, there is a present interest in: “Strengthening our understanding of the social dimensions of infrastructure” and how this “will require in-depth analysis of the array of actors and institutions that are involved in the supply of, and demand for, infrastructure services. Incorporating the complex interdependencies between individual components of the systems will allow critical feedback effects and long-term dynamics to be assessed.” (Thacker et al., 2019, p. 328). In this sense, the BOAP approach and the application I have conducted of it to Yachay contribute in the development of long term observation of the infrastructures themselves, their transformation and effects across time, as well as how individual actors and their relational infrastructures shape these processes longitudinally. These elements open the door for collaboration with other disciplines more interested in the macro scope of infrastructures and their impact on development and sustainability targets for example.

Finally, concerning smart cities and the study of what have been called “new cities” (Moser, 2015) that includes innovation oriented cities, eco-cities and cities of knowledge such as Yachay my study contributes in two ways. The appearance of this cities seems to be a global trend in the actuality as several studies suggest (Elena, 2015; Joss, 2010; Picon, 2018; Rapoport, 2015; Tan Yigitcanlar, 2008), but they also seem to have a long history often related to authoritarian regimes and colonial legacies (Angelidou, 2015; Bibri & Krogstie, 2016; Kargon & Molella, 2008c). A call emerging from the literature is to situate these cities “in a longer historical trajectory beyond the current new cities trend” and that is precisely what my study of Yachay has aimed to do. By focusing on the life of Yachay across time, I have tried to map how its roots dig deeper than the current international setting and how it resonates with longer duration political and economic processes from the country’s recent and

medium term history. Beyond that, through the empirical analysis of the relational infrastructures entangled in Yachay I have provided a path through which to study the pasts of these cities through specific relations that move through time and space but taking a single city as focus. This may prove useful for researchers interested in studying these cities empirically not only conceptually, and in action, so that relational infrastructures become visible and histories are at play. Taking these two components into attention I this believe is an important contribution from an STS perspective to the wider study of the so-called new cities.

Additionally, my study has illustrated how applying the BOAP approach to the life of such cities may prove useful if one is interested in the evolution of such cities over time, and not only on studying them in a single shot. Through the BOAP approach, one can gain an integral understanding of what components of these cities are actually innovative or new, and which emerge from longer historical trajectories and are tied to the specific settings one is studying. A longitudinal study also promotes a focus on infrastructuring processes and their change over time rather than in the closure of infrastructures under a final model, this may prove useful to understand how people actually use and reconfigure these cities in practice. In the same line, a temporal approach to smart cities and similar urban assemblages like the one I have pursued may help drawing a clearer understanding of what temporalities are colliding in them beyond the common focus on futuristic modelling and acceleration. This may help gaining a grip on the complicated dynamics shaping these cities over time, how their promises evolve and are evaluated. This is fundamental in order to understand the social shaping of these cities and not taking a technologically deterministic approach, be it utopian or dystopian, to these new urban assemblages.

7.4 Research journey and beyond: limitations of this thesis and future research

My research journey has had its up and downs. From the outset I had a lot of trouble getting access to Yachay as the project was already highly polemic in the media when I started my research in 2016. People from Yachay EP were cautious about the kind of representations any type of research might bring. After months of persistence, I

managed to get access, and I was fortunate enough to make contacts in the following weeks. I had not taken into account the constant travelling that the research would imply, I had imagined visiting the Quito offices a couple of times and then moving full time to Urcuquí or Yachay itself. However, that was not to be the case. During the following months, I would continuously travel between Quito and Urcuquí following actors, events and the course of daily work itself of the EP and YachayTech. Another difficulty was getting access again when the new administration entered the project in 2017, and I had to start over again, making new contacts, insisting, getting to know the new actors and their own visions of the project. Having to restart the process of getting access was exhausting, but it reflected the transformations that were happening within Yachay and across the public sector. Likewise, I felt that the new contexts being mobilized around the project and Ecuador complicated the story I was initially expecting to tell, but these moments also brought to the fore other elements which I may not have been so keen to analyse otherwise. When I first started this research, I thought I would end up telling the successful story of how Yachay became an important innovation pole for Ecuador and tracing the story of how expectations played a crucial role in this process. Even so, as I progressed with my fieldwork it quickly became evident that the story I thought I was pursuing was much more complicated, and expectations ended up taking a less central role as they were complemented in my analysis with the taking into account of other temporalities and the focus on other practices such as contexting. These were significant and difficult processes for me to process and at many times in the process I was not sure of the story I was going to end up telling. At many points in time I was not sure, I was going to be able to represent as many perspectives as I had been able to access. I believe the BOAP approach was very helpful in this respect as from the start it does not presupposes sociotechnical dynamics are deterministic, taking this into account I decided to take an explorative and experimental gaze both empirically, and theoretically of what was happening as the events emerged and Yachay changed quickly over time. As my journey progressed, I decided to tell the story of how Yachay was scaled-up and later on it would end up closing the circle by being scaled-down

during Moreno's government, expectations played a key role in both moments connected to other key dimensions. Overall, I am very grateful to all the people who shared with me their perspectives and documentation, especially taking into account the political turmoil at the moment.

As mentioned across the thesis, this research has pursued a BOAP approach to the investigation of Yachay. Thus it has been inspired in the ecological approach to actors in innovation and technology development arenas that characterizes this approach. Following this line, I have tried to map the diversity of actors coming together in the project and how they have both shaped and been shaped by Yachay across time. In this sense, I observed and conducted interviews with students, community members, academic authorities, researchers, public authorities from Urcuquí and at the national level, public servants from Yachay EP and YachayTech, and entrepreneurs. Nonetheless, I was not able to interview one of the critical group of actors who shaped the project's design and dynamics in its early stages: the Korean team of IFEZ. I tried multiple times and through multiple means to contact them in order to hear their perspective on the story and access the relevant documents they may have of the process, but I never managed to do it, and they did not show any interest or willingness to participate in my research. I understand this is a limitation of my study as it constitutes a blind spot within my research, and it diminishes the depth of the descriptions of Yachay's dynamics I have tried to convey. I tried to balance this absence by using the few documents I could get online from them, by gathering testimonies from actors who were close to them at the time, and by reading historical and sociological analysis of the Korean model and more specifically of the experience in Incheon. Nonetheless, the voices of the Korean actors themselves are still missing; future research on the project should consider this. Connected to this point, I want to make explicit that my study by no means intends to constitute an integral history of Yachay. I have made a continuous effort to portray with justice all the experiences that my interviewees kindly shared, but in the end, I have crafted a story among many other possible stories.

Another limitation of the study has been its focus in Yachay and the Ecuadorian setting, leaving out of focus the more international dimension of these type of projects. Given the limited duration of my doctoral investigation, I accepted that I had to focus on specific aspects of Yachay while leaving others less explored in detail. I decided to leave out of focus certain aspects of techno-science internationalization because I wanted to be able to grasp, in the limited stretch of a PhD, the specific trajectory of Yachay within Ecuador and challenge the conventional notion of technoscience in Latin America being portrayed as a simple importation from other settings (Medina, Marques, & Holmes, 2014). This was also related to the fact that the small existing literature on Yachay has focused precisely on the international aspects of the project (Chavez & Gaybor, 2018; Fernández González et al., 2018), often disregarding or overlooking the complex histories converging in the project beyond the Korean model. These studies have also focused on developing critiques of the project based on limited evidence constructed in mostly “snap-shot studies” (which the BOAP approach has been quite critical about) and thus, from my perspective, becoming an active component in the expectations hype cycles. Thus shaping, by doing so, among other things, the compressed foresight dynamics surrounding the project, and many other projects in the region.

I believe that an important academic responsibility to settings where vulnerability is a crucial factor is precisely to engage with the temporal complexities of the phenomenon. A fundamental outcome from my research has been getting to know the intricate stories converging in such an ambitious project during the fieldwork. The immersion on the project during my fieldwork convinced me of the importance of sound empirical research for the study of this kind of socio-technical assemblages, particularly with projects that are so embedded in politics and thus tend to be analysed under ideological lenses. Analyses that offer a mechanistic portrayal of sociotechnical initiatives and that reinforce expectations that these initiatives will behave in a linear, apolitical, and unproblematic, manner obliterating in that way the potentialities of repair, maintenance and reconfiguration. Concerning my ethical approach to the research, I have intended to be fair with every story as an ethical

compass, this meant for me taking it seriously and not taking sides in the multiple controversies I encountered. I intended to portray every story within the contexts it was unravelling, and respecting the specific trajectories and perspectives each actor had. This meant for me to be fair with the multiple perspectives I was encountering and with my own contingent positioning within the project. Surely, this has limited my political positioning in respect to the project, but I hope it has allowed me to convey the experiences of actors doing justice to their importance, and to how they have contributed to the overall history of Yachay over time.

Even so, I acknowledge the importance of taking international dimensions seriously and I have tried to incorporate these in a way that still sustained the focus on the specificities of the project in Ecuador. For example, by tracing the connections of actors from Yachay with Korea and the IFEZ team, and also by acknowledging the influence of several frameworks on Yachay beyond Korea. For instance, Correa's connection with Louvain-la-Neuve, the CalTech team, ASU and the model of the new American university. I have tried to connect these models with the specific people mobilizing them, the experiences that travelled with actors from other countries and their previous professional careers.

More generally, I have shown the importance of taking into account the multiple temporalities in the form of expectations, rhythms, the volatility of the present, the past trajectories, and others, which comprise the timescapes of a given project. This, along with that of relational infrastructures, aims to provide an understanding of how these timescapes drift within and between institutions and organizations. I hope these elements help to gain a better understanding of sociotechnical innovation as well as informing more coherent approaches to public policy. The case of Yachay thus illustrates why it is important for STS to take Latin America seriously as an empirically rich ground and as a fertile setting for theorizations that could expand and enrich current STS research. I have shown why taking temporalities into account makes this journey more robust and brings additional perspectives that could inform both research and public policy interventions.

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